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Note: Addenda information is NOT included with the electronic documents available via electronic file transfer. Only bidder or non-bidder package holders listed with the Caltrans Plans and Bid Documents section as described above will receive addenda information.



STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

NOTICE TO CONTRACTORS
AND
SPECIAL PROVISIONS
FOR CONSTRUCTION ON STATE HIGHWAY IN
SAN DIEGO COUNTY IN SAN DIEGO AT VARIOUS LOCATIONS

DISTRICT 11, ROUTES 5,15,75,94

For Use in Connection with Standard Specifications Dated JULY 1999, Standard Plans Dated JULY 1999, and Labor Surcharge and Equipment Rental Rates.

CONTRACT NO. 11-064614
11-SD-5,15,75,94-R19.6/R21.3,R32.6R35.4,3.3/3.6,2.2/6.4

Federal Aid Project
ACIM-000C(218)E
ACNH-000C(219)E

Bids Open: September 28, 2000
Dated: August 21, 2000

IMPORTANT SPECIAL NOTICES

- The Special Provisions for Federal-aid projects (with and without DBE goals) have been revised to incorporate changes made by new regulations governing the DBE Program (49 CFR Part 26).

Sections 2 and 5 incorporate the changes. Bidders should read these sections to become familiar with them. Attention is directed to the following significant changes:

Section 2, "Disadvantaged Business Enterprise (DBE)" revises the counting of participation by DBE primes, and the counting of trucking performed by DBE firms. The section also revises the information that must be submitted to the Department in order to receive credit for trucking.

Section 2, "Submission of DBE Information" revises the information required to be submitted to the Department to receive credit toward the DBE goal. It also revises the criteria to demonstrate good faith efforts.

Section 5, "Subcontractor and DBE Records" revises the information required to be reported at the end of the project, and information related to trucking that must be submitted throughout the project.

Section 5, "DBE Certification Status" adds new reporting requirements related to DBE certification.

Section 5, "Subcontracting" describes the efforts that must be made in the event a DBE subcontractor is terminated or fails to complete its work for any reason.

Section 5, "Prompt Progress Payment to Subcontractors" requires prompt payment to all subcontractors.

Section 5, "Prompt Payment of Withheld Funds to Subcontractors" requires the prompt payment of retention to all subcontractors.

- **SURETY 2000**

Caltrans is conducting a pilot program in cooperation with Surety 2000, to test electronic bond verification systems. The purpose of the pilot program is to test the use of Surety 2000 for verifying a bidder's bond electronically.

Surety 2000 is an Internet-based surety verification and security system, developed in conjunction with the surety industry. Surety agents may contact Surety 2000 at 1-800-660-3263.

Bidders are encouraged to participate in the pilot program. To participate, the bidder is asked to provide the "Authorization Code" provided by Surety 2000, on a separate sheet, together with the standard bidder's bond required by the specifications. The bidder's surety agent may obtain the "Authorization Code" from Surety 2000.

The Department will use the "Authorization Code" to access the Surety 2000 database, and independently verify the actual bidder's bond and document the functioning of the Surety 2000 system.

"Authorization Codes" will be used only to verify bidder's bonds, and only as part of the pilot program. The use of "Authorization Codes" will not be accepted in lieu of the bidder's bond or other bidder's security required in the specifications during the pilot study.

The function of the Surety 2000 system is to provide an easier way for Contractors to protect their bid security, and to discourage fraud. This system is available to all California admitted sureties and surety agents.

The results of the pilot study will be tabulated, and at some time in the future, the Department may consider accepting electronic bidder's bond verification in lieu of the bidder's bond specified.

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STANDARD PLANS LIST

The Standard Plan sheets applicable to this contract include, but are not limited to those indicated below. The Revised Standard Plans (RSP) and New Standard Plans (NSP) which apply to this contract are included as individual sheets of the project plans.

A10A	Abbreviations
A10B	Symbols
A20A	Pavement Markers and Traffic Lines, Typical Details
A20B	Pavement Markers and Traffic Lines, Typical Details
A20C	Pavement Markers and Traffic Lines, Typical Details
A20D	Pavement Markers and Traffic Lines, Typical Details
A62A	Excavation and Backfill - Miscellaneous Details
A62B	Limits of Payment for Excavation and Backfill - Bridge Surcharge and Wall
A62D	Excavation and Backfill - Concrete Pipe Culverts
A73B	Markers
A85	Chain Link Fence
A87	Curbs, Dikes and Driveways
H1	Planting and Irrigation - Abbreviations
H2	Planting and Irrigation - Symbols
H3	Planting and Irrigation Details
H4	Planting and Irrigation Details
H5	Planting and Irrigation Details
H6	Planting and Irrigation Details
H7	Planting and Irrigation Details
H8	Planting and Irrigation Details
T1A	Temporary Crash Cushion, Sand Filled (Unidirectional)
T1B	Temporary Crash Cushion, Sand Filled (Bidirectional)
T2	Temporary Crash Cushion, Sand Filled (Shoulder Installations)
T3	Temporary Railing (Type K)
B3-11	Retaining Wall Type 6 - 1829 mm Maximum
B7-10	Utility Opening - Box Girder
B11-47	Cable Railing
RS1	Roadside Signs, Typical Installation Details No. 1
RS2	Roadside Signs - Wood Post, Typical Installation Details No. 2
RS4	Roadside Signs, Typical Installation Details No. 4
ES-1A	Signal, Lighting and Electrical Systems - Symbols and Abbreviations
ES-1B	Signal, Lighting and Electrical Systems - Symbols and Abbreviations
ES-2A	Signal, Lighting and Electrical Systems - Service Equipment
ES-2C	Signal, Lighting and Electrical Systems - Service Equipment Notes, Type III Series
ES-2D	Signal, Lighting and Electrical Systems - Service Equipment and Typical Wiring Diagram Type III-A Series
ES-2E	Signal, Lighting and Electrical Systems - Service Equipment and Typical Wiring Diagram Type III-B Series
ES-5A	Signal, Lighting and Electrical Systems - Detectors
ES-5B	Signal, Lighting and Electrical Systems - Detectors
ES-5E	Signal, Lighting and Electrical Systems - Detectors
ES-8	Signal, Lighting and Electrical Systems - Pull Box Details
ES-9A	Signal, Lighting and Electrical Systems - Electrical Details, Structure Installations
ES-9B	Signal, Lighting and Electrical Systems - Electrical Details, Structure Installations
ES-11	Signal, Lighting and Electrical Systems - Foundation Installations
ES-13A	Signal, Lighting and Electrical Systems - Splicing Details
ES-16A	Closed Circuit Television Pole Details
ES-16B	Closed Circuit Television Pole Details - Overhead Sign Mounted

DEPARTMENT OF TRANSPORTATION

NOTICE TO CONTRACTORS

CONTRACT NO. 11-064614

11-SD-5,15,75,94-R19.6/R21.3,R32.6R35.4,3.3/3.6,2.2/6.4

Sealed proposals for the work shown on the plans entitled:

**STATE OF CALIFORNIA; DEPARTMENT OF TRANSPORTATION; PROJECT PLANS FOR CONSTRUCTION
ON STATE HIGHWAY IN SAN DIEGO COUNTY IN SAN DIEGO AT VARIOUS LOCATIONS**

will be received at the Department of Transportation, 3347 Michelson Drive, Suite 100, Irvine, CA 92612-1692, until 2 o'clock p.m. on September 28, 2000, at which time they will be publicly opened and read in Room C - 1116 at the same address.

Proposal forms for this work are included in a separate book entitled:

**STATE OF CALIFORNIA; DEPARTMENT OF TRANSPORTATION; PROPOSAL AND CONTRACT
FOR CONSTRUCTION ON STATE HIGHWAY IN SAN DIEGO COUNTY IN SAN DIEGO
AT VARIOUS LOCATIONS**

General work description: Construct fiber optic and closed circuit television system (Phase 4).

This project has a goal of 15 percent disadvantaged business enterprise (DBE) participation.
No prebid meeting is scheduled for this project.

**THIS PROJECT IS SUBJECT TO THE "BUY AMERICA" PROVISIONS OF THE SURFACE
TRANSPORTATION ASSISTANCE ACT OF 1982 AS AMENDED BY THE INTERMODAL SURFACE
TRANSPORTATION EFFICIENCY ACT OF 1991.**

Bids are required for the entire work described herein.

At the time this contract is awarded, the Contractor shall possess either a Class A license or a Class C-10 license.

This contract is subject to state contract nondiscrimination and compliance requirements pursuant to Government Code, Section 12990.

The Caltrans District 11 Office is located at 2829 Juan Street, San Diego, CA 92110. The mailing address is P.O. Box 85406, San Diego, CA 92186-5406, E-mail address of the Duty Senior is: Duty_Senior_Const_District11@dot.ca.gov, or by fax at (619) 688-6988. The District 11 Duty Senior telephone number is (619) 688-6635.

The Website address for posting of questions and responses is: www.dot.ca.gov/dist11/construc/

Project plans, special provisions, and proposal forms for bidding this project can only be obtained at the Department of Transportation, Plans and Bid Documents, Room 0200, MS #26, Transportation Building, 1120 N Street, Sacramento, California 95814, FAX No. (916) 654-7028, Telephone No. (916) 654-4490. Use FAX orders to expedite orders for project plans, special provisions and proposal forms. FAX orders must include credit card charge number, card expiration date and authorizing signature. Project plans, special provisions, and proposal forms may be seen at the above Department of Transportation office and at the offices of the District Directors of Transportation at Irvine, Oakland, and the district in which the work is situated. Standard Specifications are available through the State of California, Department of Transportation, Publications Unit, 1900 Royal Oaks Drive, Sacramento, CA 95815, Telephone No. (916) 445-3520.

Cross sections for this project are not available.

The successful bidder shall furnish a payment bond and a performance bond.

The Department of Transportation hereby notifies all bidders that it will affirmatively insure that in any contract entered into pursuant to this advertisement, disadvantaged business enterprises will be afforded full opportunity to submit bids in response to this invitation.

The U.S. Department of Transportation (DOT) provides a toll-free "hotline" service to report bid rigging activities. Bid rigging activities can be reported Mondays through Fridays, between 8:00 a.m. and 5:00 p.m., eastern time, Telephone No. 1-800-424-9071. Anyone with knowledge of possible bid rigging, bidder collusion, or other fraudulent activities should use the "hotline" to report these activities. The "hotline" is part of the DOT's continuing effort to identify and investigate highway construction contract fraud and abuse and is operated under the direction of the DOT Inspector General. All information will be treated confidentially and caller anonymity will be respected.

Pursuant to Section 1773 of the Labor Code, the general prevailing wage rates in the county, or counties, in which the work is to be done have been determined by the Director of the California Department of Industrial Relations. These wages are set forth in the General Prevailing Wage Rates for this project, available at the Labor Compliance Office at the offices of the District Director of Transportation for the district in which the work is situated, and available from the California Department of Industrial Relations' Internet Web Site at: <http://www.dir.ca.gov>. The Federal minimum wage rates for this project as predetermined by the United States Secretary of Labor are set forth in the books issued for bidding purposes entitled "Proposal and Contract," and in copies of this book that may be examined at the offices described above where project plans, special provisions, and proposal forms may be seen. Addenda to modify the Federal minimum wage rates, if necessary, will be issued to holders of "Proposal and Contract" books. Future effective general prevailing wage rates which have been predetermined and are on file with the California Department of Industrial Relations are referenced but not printed in the general prevailing wage rates.

Attention is directed to the Federal minimum wage rate requirements in the books entitled "Proposal and Contract." If there is a difference between the minimum wage rates predetermined by the Secretary of Labor and the general prevailing wage rates determined by the Director of the California Department of Industrial Relations for similar classifications of labor, the Contractor and subcontractors shall pay not less than the higher wage rate. The Department will not accept lower State wage rates not specifically included in the Federal minimum wage determinations. This includes "helper" (or other classifications based on hours of experience) or any other classification not appearing in the Federal wage determinations. Where Federal wage determinations do not contain the State wage rate determination otherwise available for use by the Contractor and subcontractors, the Contractor and subcontractors shall pay not less than the Federal minimum wage rate which most closely approximates the duties of the employees in question.

DEPARTMENT OF TRANSPORTATION

Deputy Director Transportation Engineering

Dated August 21, 2000

ISdR

COPY OF ENGINEER'S ESTIMATE
(NOT TO BE USED FOR BIDDING PURPOSES)

11-064614

Item	Item Code	Item	Unit of Measure	Estimated Quantity
1	074019	PREPARE STORM WATER POLLUTION PREVENTION PLAN	LS	LUMP SUM
2	074020	WATER POLLUTION CONTROL	LS	LUMP SUM
3	074023	TEMPORARY EROSION CONTROL	M2	33 000
4	074028	TEMPORARY FIBER ROLL	M	11
5	074029	TEMPORARY SILT FENCE	M	260
6	019579	TEMPORARY GRAVEL BAG	EA	40
7	120090	CONSTRUCTION AREA SIGNS	LS	LUMP SUM
8	120100	TRAFFIC CONTROL SYSTEM	LS	LUMP SUM
9	128650	PORTABLE CHANGEABLE MESSAGE SIGN	EA	2
10	129000	TEMPORARY RAILING (TYPE K)	M	100
11	150771	REMOVE ASPHALT CONCRETE DIKE	M	200
12	152390	RELOCATE ROADSIDE SIGN	EA	1
13	153154	COLD PLANE ASPHALT CONCRETE PAVEMENT (60 MM MAXIMUM)	M2	9400
14	153210	REMOVE CONCRETE	M3	5
15	153531	ACCESS OPENING, SOFFIT	EA	4
16	190101	ROADWAY EXCAVATION	M3	730
17	192037	STRUCTURE EXCAVATION (RETAINING WALL)	M3	120
18	193013	STRUCTURE BACKFILL (RETAINING WALL)	M3	28
19 (S)	200001	HIGHWAY PLANTING	LS	LUMP SUM
20 (S)	204099	PLANT ESTABLISHMENT WORK	LS	LUMP SUM

Item	Item Code	Item	Unit of Measure	Estimated Quantity
21 (S)	208000	IRRIGATION SYSTEM	LS	LUMP SUM
22	260201	CLASS 2 AGGREGATE BASE	M3	300
23	374002	ASPHALTIC EMULSION (FOG SEAL COAT)	TONN	5
24	390102	ASPHALT CONCRETE (TYPE A)	TONN	1820
25	394001	PLACE ASPHALT CONCRETE DIKE	M	200
26	397001	ASPHALTIC EMULSION (PAINT BINDER)	TONN	5
27	513551	RETAINING WALL STEM (TYPE 6)	M2	45
28 (S)	515075	CORE CONCRETE (151 MM - 200 MM)	M	16
29	731501	MINOR CONCRETE (CURB)	M3	5
30 (S)	802584	0.9 M CHAIN LINK GATE (TYPE CL-1.8)	EA	1
31 (S)	802590	1.8 M CHAIN LINK GATE (TYPE CL-1.8)	EA	2
32 (S)	839521	CABLE RAILING	M	31
33 (S)	840656	PAINT TRAFFIC STRIPE (2-COAT)	M	6600
34 (S)	850111	PAVEMENT MARKER (RETROREFLECTIVE)	EA	100
35	019535	334 CABINET FOUNDATION	EA	7
36	019536	CCTV CABINET	EA	7
37	019537	ROTOR DRILL 332 OR 334 FOUNDATION	EA	9
38	019538	REPLACEMENT OF STATE-FURNISHED CABINETS	EA	9
39	019539	TRENCH DELINEATOR	EA	54
40	860620	TYPE III SERVICE EQUIPMENT ENCLOSURE	EA	2

Item	Item Code	Item	Unit of Measure	Estimated Quantity
41	019540	MODIFY SERVICE EQUIPMENT	EA	6
42	019541	HUB CABINET WITH FOUNDATION	EA	1
43	019542	27C (BRIDGE) - RTE 75	M	2500
44	019543	2-27C CONDUIT (BRIDGE)	M	25
45	019544	2-27C CONDUIT (SHARED TRENCH IN SHOULDER)	M	510
46	019545	2-27C CONDUIT (SHARED TRENCH IN UNPAVED AREA)	M	310
47	019546	2-27C CONDUIT (JACK)	M	410
48	019547	2-27C/53C CONDUIT (SHARED TRENCH IN SHOULDER)	M	160
49	019548	2-27C/53C CONDUIT (SHARED TRENCH IN UNPAVED AREA)	M	150
50	019549	2-27C/53C CONDUIT (JACK)	M	110
51	019550	2-27C/78C CONDUIT (JACK)	M	130
52	019551	8-27C CONDUIT IN MEDIAN	M	305
53	019552	53C CONDUIT (TRENCH IN SHOULDER)	M	20
54	019553	53C CONDUIT (TRENCH IN UNPAVED AREA)	M	35
55	019554	53C CONDUIT (JACK)	M	45
56	019555	78C CONDUIT (TRENCH IN UNPAVED AREA)	M	100
57	019556	78C CONDUIT (JACK)	M	100
58	019557	MDCS (4) - (TRENCH IN SHOULDER)	M	300
59	019558	MDCS (8) - (TRENCH IN SHOULDER)	M	3600
60	019559	MDCS (8) - (TRENCH IN PAVED AREA)	M	180

Item	Item Code	Item	Unit of Measure	Estimated Quantity
61	019560	MDCS (8) - (JACK)	M	1300
62	019561	MDCS (8) - (BRIDGE)	M	170
63	019562	MDCS (8)/53C CONDUIT (SHARED TRENCH IN SHOULDER)	M	180
64	019563	MDCS (8)/53C CONDUIT (SHARED TRENCH IN UNPAVED AREA)	M	125
65	019564	MDCS (8)/53C CONDUIT (JACK)	M	120
66	019565	MDCS (8)/2-27C CONDUIT (SHARED TRENCH IN SHOULDER)	M	30
67	019566	MDCS (8)/2-27C CONDUIT (JACK)	M	60
68	019567	MDCS (4) - (JACK)	M	30
69	019568	MDCS (4) - (TRENCH IN UNPAVED AREA)	M	150
70	019569	MDCS (4) - (BRIDGE)	M	40
71	860810	INDUCTIVE LOOP DETECTOR	EA	28
72	019570	CCTV 40 POLE	EA	4
73	019571	CCTV 20 POLE	EA	1
74	019572	CCTV 15 POLE	EA	1
75	019573	6 SINGLEMODE FIBER OPTIC CABLE	M	4000
76	867017	48 SINGLEMODE FIBER OPTIC CABLE	M	6600
77	867019	60 SINGLEMODE FIBER OPTIC CABLE	M	9600
78	019574	FIBER DISTRIBUTION UNIT	EA	24
79	019575	CONDUCTORS AND CABLES	M	1920
80	019576	JUNCTION BOX	EA	1

Item	Item Code	Item	Unit of Measure	Estimated Quantity
81	869040	PULL BOX	EA	87
82	019577	FIBER OPTIC VAULT	EA	20
83	019578	SPLICE CLOSURE	EA	11
84	869080	TRAINING	LS	LUMP SUM
85	999990	MOBILIZATION	LS	LUMP SUM

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISIONS

Annexed to Contract No. 11-064614

SECTION 1. SPECIFICATIONS AND PLANS

The work embraced herein shall conform to the provisions in the Standard Specifications dated July 1999, and the Standard Plans dated July 1999, of the Department of Transportation insofar as the same may apply, and these special provisions.

Amendments to the Standard Specifications set forth in these special provisions shall be considered as part of the Standard Specifications for the purposes set forth in Section 5-1.04, "Coordination and Interpretation of Plans, Standard Specifications and Special Provisions," of the Standard Specifications. Whenever either the term "Standard Specifications is amended" or the term "Standard Specifications are amended" is used in the special provisions, the indented text or table following the term shall be considered an amendment to the Standard Specifications. In case of conflict between such amendments and the Standard Specifications, the amendments shall take precedence over and be used in lieu of the conflicting portions.

In case of conflict between the Standard Specifications and these special provisions, the special provisions shall take precedence over and shall be used in lieu of the conflicting portions.

SECTION 2. PROPOSAL REQUIREMENTS AND CONDITIONS

2-1.01 GENERAL

The bidder's attention is directed to the provisions in Section 2, "Proposal Requirements and Conditions," of the Standard Specifications and these special provisions for the requirements and conditions which the bidder must observe in the preparation of the Proposal form and the submission of the bid.

In addition to the subcontractors required to be listed in conformance with Section 2-1.054, "Required Listing of Proposed Subcontractors," of the Standard Specifications, each proposal shall have listed therein the portion of work that will be performed by each subcontractor listed.

The Bidder's Bond form mentioned in the last paragraph in Section 2-1.07, "Proposal Guaranty," of the Standard Specifications will be found following the signature page of the Proposal.

Submit request for substitution of an "or equal" item, and the data substantiating the request to the Department of Transportation, District 11, Construction Duty Senior MS 73, P.O. Box 85406, San Diego, CA. 92186-5400, so that the request is received by the Department by close of business on the fourth day, not including Saturdays, Sundays and legal holidays, following bid opening.

In conformance with Public Contract Code Section 7106, a Noncollusion Affidavit is included in the Proposal. Signing the Proposal shall also constitute signature of the Noncollusion Affidavit.

The contractor, sub recipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the recipient deems appropriate. Each subcontract signed by the bidder must include this assurance.

2-1.015 FEDERAL LOBBYING RESTRICTIONS

Section 1352, Title 31, United States Code prohibits Federal funds from being expended by the recipient or any lower tier subrecipient of a Federal-aid contract to pay for any person for influencing or attempting to influence a Federal agency or Congress in connection with the awarding of any Federal-aid contract, the making of any Federal grant or loan, or the entering into of any cooperative agreement.

If any funds other than Federal funds have been paid for the same purposes in connection with this Federal-aid contract, the recipient shall submit an executed certification and, if required, submit a completed disclosure form as part of the bid documents.

A certification for Federal-aid contracts regarding payment of funds to lobby Congress or a Federal agency is included in the Proposal. Standard Form - LLL, "Disclosure of Lobbying Activities," with instructions for completion of the Standard Form is also included in the Proposal. Signing the Proposal shall constitute signature of the Certification.

The above-referenced certification and disclosure of lobbying activities shall be included in each subcontract and any lower-tier contracts exceeding \$100,000. All disclosure forms, but not certifications, shall be forwarded from tier to tier until received by the Engineer.

The Contractor, subcontractors and any lower-tier contractors shall file a disclosure form at the end of each calendar quarter in which there occurs any event that requires disclosure or that materially affects the accuracy of the information contained in any disclosure form previously filed by the Contractor, subcontractors and any lower-tier contractors. An event that materially affects the accuracy of the information reported includes:

- A. A cumulative increase of \$25,000 or more in the amount paid or expected to be paid for influencing or attempting to influence a covered Federal action; or
- B. A change in the person(s) or individual(s) influencing or attempting to influence a covered Federal action; or,
- C. A change in the officer(s), employee(s), or Member(s) contacted to influence or attempt to influence a covered Federal action.

2-1.02 DISADVANTAGED BUSINESS ENTERPRISE (DBE)

This project is subject to Part 26, Title 49, Code of Federal Regulations entitled "Participation by Disadvantaged Business Enterprises in Department of Transportation Financial Assistance Programs." The Regulations in their entirety are incorporated herein by this reference.

Bidders shall be fully informed respecting the requirements of the Regulations and the Department's Disadvantaged Business Enterprise (DBE) program developed pursuant to the Regulations; particular attention is directed to the following matters:

- A. A DBE must be a small business concern as defined pursuant to Section 3 of U.S. Small Business Act and relevant regulations promulgated pursuant thereto.
- B. A DBE may participate as a prime contractor, subcontractor, joint venture partner with a prime or subcontractor, vendor of material or supplies, or as a trucking company.
- C. A DBE bidder, not bidding as a joint venture with a non-DBE, will be required to document one or a combination of the following:
 - 1. The bidder will meet the goal by performing work with its own forces.
 - 2. The bidder will meet the goal through work performed by DBE subcontractors, suppliers or trucking companies.
 - 3. The bidder, prior to bidding, made adequate good faith efforts to meet the goal.
- D. A DBE joint venture partner must be responsible for specific contract items of work, or portions thereof. Responsibility means actually performing, managing and supervising the work with its own forces. The DBE joint venture partner must share in the capital contribution, control, management, risks and profits of the joint venture. The DBE joint venturer must submit the joint venture agreement with the proposal or the DBE Information form required in the Section entitled "Submission of DBE Information" of these special provisions.
- E. A DBE must perform a commercially useful function, i.e., must be responsible for the execution of a distinct element of the work and must carry out its responsibility by actually performing, managing and supervising the work.
- F. DBEs must be certified by either the California Department of Transportation, or by a participating State of California or local agency which certifies in conformance with Title 49, Code of Federal Regulations, Part 26, as of the date of bid opening. It is the Contractor's responsibility to verify that DBEs are certified. Listings of DBEs certified by the Department are available from the following sources:
 - 1. The Department's DBE Directory, which is published quarterly. This Directory may be obtained from the Department of Transportation, Materiel Operations Branch, Publication Distribution Unit, 1900 Royal Oaks Drive, Sacramento, California 95815, Telephone: (916) 445-3520.

2. The Department's Electronic Information Bulletin Board Service, which is accessible by modem and is updated weekly. The Bulletin Board may be accessed by first contacting the Department's Business Enterprise Program at Telephone: (916) 227-8937 and obtaining a user identification and password.
3. The Department's web site at <http://www.dot.ca.gov/hq/bep/index.htm>.
4. The organizations listed in the Section entitled "DBE Goal for this Project" of these special provisions.

G. Credit for materials or supplies purchased from DBEs will be as follows:

1. If the materials or supplies are obtained from a DBE manufacturer, 100 percent of the cost of the materials or supplies will count toward the DBE goal. A DBE manufacturer is a firm that operates or maintains a factory or establishment that produces, on the premises, the materials, supplies, articles, or equipment required under the contract and of the general character described by the specifications.
2. If the materials or supplies are purchased from a DBE regular dealer, 60 percent of the cost of the materials or supplies will count toward the DBE goal. A DBE regular dealer is a firm that owns, operates, or maintains a store, warehouse, or other establishment in which the materials, supplies, articles or equipment of the general character described by the specifications and required under the contract are bought, kept in stock, and regularly sold or leased to the public in the usual course of business. To be a DBE regular dealer, the firm must be an established, regular business that engages, as its principal business and under its own name, in the purchase and sale or lease of the products in question. A person may be a DBE regular dealer in such bulk items as petroleum products, steel, cement, gravel, stone, or asphalt without owning, operating, or maintaining a place of business as provided in this paragraph G.2. if the person both owns and operates distribution equipment for the products. Any supplementing of regular dealers' own distribution equipment shall be by a long-term lease agreement and not on an ad hoc or contract-by-contract basis. Packagers, brokers, manufacturers' representatives, or other persons who arrange or expedite transactions are not DBE regular dealers within the meaning of this paragraph G.2.
3. Credit for materials or supplies purchased from a DBE which is neither a manufacturer nor a regular dealer will be limited to the entire amount of fees or commissions charged for assistance in the procurement of the materials and supplies, or fees or transportation charges for the delivery of materials or supplies required on a job site, provided the fees are reasonable and not excessive as compared with fees charged for similar services.

H. Credit for DBE trucking companies will be as follows:

1. The DBE must be responsible for the management and supervision of the entire trucking operation for which it is responsible on a particular contract, and there cannot be a contrived arrangement for the purpose of meeting the DBE goal.
2. The DBE must itself own and operate at least one fully licensed, insured, and operational truck used on the contract.
3. The DBE receives credit for the total value of the transportation services it provides on the contract using trucks it owns, insures, and operates using drivers it employs.
4. The DBE may lease trucks from another DBE firm, including an owner-operator who is certified as a DBE. The DBE who leases trucks from another DBE receives credit for the total value of the transportation services the lessee DBE provides on the contract.
5. The DBE may also lease trucks from a non-DBE firm, including an owner-operator. The DBE who leases trucks from a non-DBE is entitled to credit only for the fee or commission it receives as a result of the lease arrangement. The DBE does not receive credit for the total value of the transportation services provided by the lessee, since these services are not provided by a DBE.
6. For the purposes of this paragraph H, a lease must indicate that the DBE has exclusive use of and control over the truck. This does not preclude the leased truck from working for others during the term of the lease with the consent of the DBE, so long as the lease gives the DBE absolute priority for use of the leased truck. Leased trucks must display the name and identification number of the DBE.

- I. Noncompliance by the Contractor with the requirements of the regulations constitutes a breach of this contract and may result in termination of the contract or other appropriate remedy for a breach of this contract.
- J. Bidders are encouraged to use services offered by financial institutions owned and controlled by DBEs.

2-1.02A DBE GOAL FOR THIS PROJECT

The Department has established the following goal for Disadvantaged Business Enterprise (DBE) participation for this project:

Disadvantaged Business Enterprise (DBE): 15 percent

Bidders may use the services of the following firms to contact interested DBEs. These firms are available to assist DBEs in preparing bids for subcontracting or supplying materials.

The following firms may be contacted for projects in the following locations:

Districts 04, 05 (except San Luis Obispo and Santa Barbara Counties), 06 (except Kern County) and 10:	Districts 08, 11 and 12:
Triaxial Management Services, Inc. - Oakland 1545 Willow Street, 1st Floor Oakland, CA 94607 Telephone - (510) 286-1313 FAX No. - (510) 286-6792	Triaxial Management Services, Inc. - San Diego 2725 Congress Street, Suite 1-D San Diego, CA 92110 Telephone - (619) 543-5109 FAX No. - (619) 543-5108
Districts 07 and 08; in San Luis Obispo and Santa Barbara Counties in District 05; and in Kern County in District 06:	Districts 01, 02, 03 and 09:
Triaxial Management Services, Inc. - Los Angeles 2594 Industry Way, Suite 101 Lynwood, CA 90262 Telephone - (310) 537-6677 FAX No. - (310) 637-0128	Triaxial Management Services, Inc. - Sacramento 930 Alhambra Blvd., #205 Sacramento, CA 95816 Telephone - (916) 553-4172 FAX No. - (916) 553-4173

2-1.02B SUBMISSION OF DBE INFORMATION

The required DBE information shall be submitted on the "CALTRANS BIDDER - DBE INFORMATION" form included in the Proposal. If the DBE information is not submitted with the bid, the DBE Information form shall be removed from the documents prior to submitting the bid.

It is the bidder's responsibility to make enough work available to DBEs and to select those portions of the work or material needs consistent with the available DBEs to meet the goal for DBE participation or to provide information to establish that, prior to bidding, the bidder made adequate good faith efforts to do so.

If DBE information is not submitted with the bid, the apparent successful bidder (low bidder), the second low bidder and the third low bidder shall submit DBE information to the Department of Transportation, 1120 N Street, Room 0200, MS #26, Sacramento, California 95814 so the information is received by the Department no later than 4:00 p.m. on the fourth day, not including Saturdays, Sundays and legal holidays, following bid opening. DBE information sent by U.S. Postal Service certified mail with return receipt and certificate of mailing and mailed on or before the third day, not including Saturdays, Sundays and legal holidays, following bid opening will be accepted even if it is received after the fourth day following bid opening. Failure to submit the required DBE information by the time specified will be grounds for finding the bid or proposal nonresponsive. Other bidders need not submit DBE information unless requested to do so by the Department.

The bidder's DBE information shall establish that good faith efforts to meet the DBE goal have been made. To establish good faith efforts, the bidder shall demonstrate that the goal will be met or that, prior to bidding, adequate good faith efforts to meet the goal were made.

Bidders are cautioned that even though their submittal indicates they will meet the stated DBE goal, their submittal should also include their adequate good faith efforts information along with their DBE goal information to protect their eligibility for award of the contract in the event the Department, in its review, finds that the goal has not been met.

The bidder's DBE information shall include the names, addresses and phone numbers of DBE firms that will participate, with a complete description of work or supplies to be provided by each, the dollar value of each DBE transaction, and a written confirmation from the DBE that it is participating in the contract. A copy of the DBE's quote will serve as written

confirmation that the DBE is participating in the contract. When 100 percent of a contract item of work is not to be performed or furnished by a DBE, a description of the exact portion of that work to be performed or furnished by that DBE shall be included in the DBE information, including the planned location of that work. The work that a DBE prime contractor has committed to performing with its own forces as well as the work that it has committed to be performed by DBE subcontractors, suppliers and trucking companies will count toward the goal.

The information necessary to establish the bidder's adequate good faith efforts to meet the DBE goal should include:

- A. The names and dates of each publication in which a request for DBE participation for this project was placed by the bidder.
- B. The names and dates of written notices sent to certified DBEs soliciting bids for this project and the dates and methods used for following up initial solicitations to determine with certainty whether the DBEs were interested.
- C. The items of work which the bidder made available to DBE firms, including, where appropriate, any breaking down of the contract work items (including those items normally performed by the bidder with its own forces) into economically feasible units to facilitate DBE participation. It is the bidder's responsibility to demonstrate that sufficient work to meet the DBE goal was made available to DBE firms.
- D. The names, addresses and phone numbers of rejected DBE firms, the firms selected for that work, and the reasons for the bidder's choice.
- E. Efforts made to assist interested DBEs in obtaining bonding, lines of credit or insurance, and any technical assistance or information related to the plans, specifications and requirements for the work which was provided to DBEs.
- F. Efforts made to assist interested DBEs in obtaining necessary equipment, supplies, materials, or related assistance or services, excluding supplies and equipment the DBE subcontractor purchases or leases from the prime contractor or its affiliate.
- G. The names of agencies contacted to provide assistance in contacting, recruiting and using DBE firms.
- H. Any additional data to support a demonstration of good faith efforts.

SECTION 3. AWARD AND EXECUTION OF CONTRACT

The bidder's attention is directed to the provisions in Section 3, "Award and Execution of Contract," of the Standard Specifications and these special provisions for the requirements and conditions concerning award and execution of contract.

The award of the contract, if it be awarded, will be to the lowest responsible bidder whose proposal complies with all the requirements prescribed and who has met the goal for DBE participation or has demonstrated, to the satisfaction of the Department, adequate good faith efforts to do so. Meeting the goal for DBE participation or demonstrating, to the satisfaction of the Department, adequate good faith efforts to do so is a condition for being eligible for award of contract.

A "Payee Data Record" form will be included in the contract documents to be executed by the successful bidder. The purpose of the form is to facilitate the collection of taxpayer identification data. The form shall be completed and returned to the Department by the successful bidder with the executed contract and contract bonds. For the purposes of the form, payee shall be deemed to mean the successful bidder. The form is not to be completed for subcontractors or suppliers. Failure to complete and return the "Payee Data Record" form to the Department as provided herein will result in the retention of 31 percent of payments due the contractor and penalties of up to \$20,000. This retention of payments for failure to complete the "Payee Data Record" form is in addition to any other retention of payments due the Contractor.

SECTION 4. BEGINNING OF WORK, TIME OF COMPLETION AND LIQUIDATED DAMAGES

Attention is directed to the provisions in Sections 8-1.03, "Beginning of Work," 8-1.06, "Time of Completion," 8-1.07, "Liquidated Damages," and 20-4.08, "Plant Establishment Work," of the Standard Specifications and these special provisions.

The Contractor shall furnish the Engineer with a fiber optic systems materials list containing a complete item description for each fiber optic communication system item to be ordered. The list shall be furnished within 15 calendar days after the contract has been approved by the Attorney General, or the attorney appointed and authorized to represent the Department of Transportation.

The Contractor shall begin work within 120 calendar days after the contract has been approved by the Attorney General or the attorney appointed and authorized to represent the Department of Transportation.

The work (except plant establishment work) shall be diligently prosecuted to completion before the expiration of **220 WORKING DAYS** beginning on the one hundred twentieth calendar day after approval of the contract.

The Contractor shall pay to the State of California the sum of \$1,100.00 per day, for each and every calendar day's delay in finishing the work (except plant establishment work) in excess of the number of working days prescribed above.

The Contractor shall diligently prosecute all work (including plant establishment) to completion before the expiration of **340 WORKING DAYS** beginning on the one hundred twentieth calendar day after approval of the contract.

The Contractor shall pay to the State of California the sum of \$250 per day, for each and every calendar day's delay in completing the work in excess of the number of working days prescribed above.

In no case will liquidated damages of more than \$1,100.00 per day be assessed.

The 72 hours advance notice before beginning work specified in Section 8-1.03, "Beginning of Work," of the Standard Specifications is changed to 5 days advance notice for this project.

SECTION 5. GENERAL

SECTION 5-1. MISCELLANEOUS

5-1.01 PLANS AND WORKING DRAWINGS

When the specifications require working drawings to be submitted to the Division of Structure Design, the drawings shall be submitted to: Division of Structure Design, Documents Unit, Mail Station 9, 1801 30th Street, Sacramento, CA 95816, Telephone 916 227-8252.

5-1.015 LABORATORY

When a reference is made in the specifications to the "Laboratory," the reference shall mean the Division of Materials Engineering and Testing Services and the Division of Structural Foundations of the Department of Transportation, or established laboratories of the various Districts of the Department, or other laboratories authorized by the Department to test materials and work involved in the contract. When a reference is made in the specifications to the "Transportation Laboratory," the reference shall mean the Division of Materials Engineering and Testing Services and the Division of Structural Foundations, located at 5900 Folsom Boulevard, Sacramento, CA 95819, Telephone (916) 227-7000.

5-1.02 LABOR NONDISCRIMINATION

Attention is directed to the following Notice that is required by Chapter 5 of Division 4 of Title 2, California Code of Regulations.

NOTICE OF REQUIREMENT FOR NONDISCRIMINATION PROGRAM (GOV. CODE, SECTION 12990)

Your attention is called to the "Nondiscrimination Clause", set forth in Section 7-1.01A(4), "Labor Nondiscrimination," of the Standard Specifications, which is applicable to all nonexempt State contracts and subcontracts, and to the "Standard California Nondiscrimination Construction Contract Specifications" set forth therein. The specifications are applicable to all nonexempt State construction contracts and subcontracts of \$5000 or more.

5-1.03 INTEREST ON PAYMENTS

Interest shall be payable on progress payments, payments after acceptance, final payments, extra work payments, and claim payments as follows:

- A. Unpaid progress payments, payment after acceptance, and final payments shall begin to accrue interest 30 days after the Engineer prepares the payment estimate.
- B. Unpaid extra work bills shall begin to accrue interest 30 days after preparation of the first pay estimate following receipt of a properly submitted and undisputed extra work bill. To be properly submitted, the bill must be submitted within 7 days of the performance of the extra work and in conformance with the provisions in Section 9-1.03C, "Records," and Section 9-1.06, "Partial Payments," of the Standard Specifications. An undisputed extra work bill not submitted within 7 days of performance of the extra work will begin to accrue interest 30 days after the preparation of the second pay estimate following submittal of the bill.
- C. The rate of interest payable for unpaid progress payments, payments after acceptance, final payments, and extra work payments shall be 10 percent per annum.
- D. The rate of interest payable on a claim, protest or dispute ultimately allowed under this contract shall be 6 percent per annum. Interest shall begin to accrue 61 days after the Contractor submits to the Engineer information in sufficient detail to enable the Engineer to ascertain the basis and amount of said claim, protest or dispute.

The rate of interest payable on any award in arbitration shall be 6 percent per annum if allowed under the provisions of Civil Code Section 3289.

5-1.04 PUBLIC SAFETY

The Contractor shall provide for the safety of traffic and the public in conformance with the provisions in Section 7-1.09, "Public Safety," of the Standard Specifications and these special provisions.

The Contractor shall install temporary railing (Type K) between a lane open to public traffic and an excavation, obstacle or storage area when the following conditions exist:

- A. Excavations.—The near edge of the excavation is 3.6 m or less from the edge of the lane, except:
 - 1. Excavations covered with sheet steel or concrete covers of adequate thickness to prevent accidental entry by traffic or the public.
 - 2. Excavations less than 0.3-m deep.
 - 3. Trenches less than 0.3-m wide for irrigation pipe or electrical conduit, or excavations less than 0.3-m in diameter.
 - 4. Excavations parallel to the lane for the purpose of pavement widening or reconstruction.
 - 5. Excavations in side slopes, where the slope is steeper than 1:4 (vertical:horizontal).
 - 6. Excavations protected by existing barrier or railing.
- B. Temporarily Unprotected Permanent Obstacles.—The work includes the installation of a fixed obstacle together with a protective system, such as a sign structure together with protective railing, and the Contractor elects to install the obstacle prior to installing the protective system; or the Contractor, for the Contractor's convenience and with permission of the Engineer, removes a portion of an existing protective railing at an obstacle and does not replace such railing complete in place during the same day.
- C. Storage Areas.—Material or equipment is stored within 3.6 m of the lane and the storage is not otherwise prohibited by the provisions of the Standard Specifications and these special provisions.

The approach end of temporary railing (Type K), installed in conformance with the provisions in this section "Public Safety" and in Section 7-1.09, "Public Safety," of the Standard Specifications, shall be offset a minimum of 4.6 m from the edge of the traffic lane open to public traffic. The temporary railing shall be installed on a skew toward the edge of the traffic lane of not more than 0.3-m transversely to 3 m longitudinally with respect to the edge of the traffic lane. If the 4.6-m minimum offset cannot be achieved, the temporary railing shall be installed on the 10 to 1 skew to obtain the maximum available offset between the approach end of the railing and the edge of the traffic lane, and an array of temporary crash cushion modules shall be installed at the approach end of the temporary railing.

Temporary railing (Type K) shall conform to the provisions in Section 12-3.08, "Temporary Railing (Type K)," of the Standard Specifications. Temporary railing (Type K), conforming to the details shown on 1999 Standard Plan T3, may be used. Temporary railing (Type K) fabricated prior to January 1, 1993, and conforming to 1988 Standard Plan B11-30 may be used, provided the fabrication date is printed on the required Certificate of Compliance.

Temporary crash cushion modules shall conform to the provisions in "Temporary Crash Cushion Module" of these special provisions.

Except for installing, maintaining and removing traffic control devices, whenever work is performed or equipment is operated in the following work areas, the Contractor shall close the adjacent traffic lane unless otherwise provided in the Standard Specifications and these special provisions:

Approach Speed of Public Traffic (Posted Limit) (Kilometers Per Hour)	Work Areas
Over 72 (45 Miles Per Hour)	Within 1.8 m of a traffic lane but not on a traffic lane
56 to 72 (35 to 45 Miles Per Hour)	Within 0.9-m of a traffic lane but not on a traffic lane

The lane closure provisions of this section shall not apply if the work area is protected by permanent or temporary railing or barrier.

When traffic cones or delineators are used to delineate a temporary edge of a traffic lane, the line of cones or delineators shall be considered to be the edge of the traffic lane, however, the Contractor shall not reduce the width of an existing lane to less than 3 m without written approval from the Engineer.

When work is not in progress on a trench or other excavation that required closure of an adjacent lane, the traffic cones or portable delineators used for the lane closure shall be placed off of and adjacent to the edge of the traveled way. The spacing of the cones or delineators shall be not more than the spacing used for the lane closure.

Suspended loads or equipment shall not be moved nor positioned over public traffic or pedestrians.

Full compensation for conforming to the provisions in this section "Public Safety," including furnishing and installing temporary railing (Type K) and temporary crash cushion modules, shall be considered as included in the contract prices paid for the various items of work involved and no additional compensation will be allowed therefor.

5-1.05 SURFACE MINING AND RECLAMATION ACT

Attention is directed to the Surface Mining and Reclamation Act of 1975, commencing in Public Resources Code, Mining and Geology, Section 2710, which establishes regulations pertinent to surface mining operations.

Material from mining operations furnished for this project shall only come from permitted sites in compliance with the Surface Mining and Reclamation Act of 1975.

The requirements of this section shall apply to materials furnished for the project, except for acquisition of materials in conformance with the provisions in Section 4-1.05, "Use of Materials Found on the Work," of the Standard Specifications.

5-1.06 REMOVAL OF ASBESTOS AND HAZARDOUS SUBSTANCES

When the presence of asbestos or hazardous substances are not shown on the plans or indicated in the specifications and the Contractor encounters materials which the Contractor reasonably believes to be asbestos or a hazardous substance as defined in Section 25914.1 of the Health and Safety Code, and the asbestos or hazardous substance has not been rendered harmless, the Contractor may continue work in unaffected areas reasonably believed to be safe. The Contractor shall immediately cease work in the affected area and report the condition to the Engineer in writing.

In conformance with Section 25914.1 of the Health and Safety Code, removal of asbestos or hazardous substances including exploratory work to identify and determine the extent of the asbestos or hazardous substance will be performed by separate contract.

If delay of work in the area delays the current controlling operation, the delay will be considered a right of way delay and the Contractor will be compensated for the delay in conformance with the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

5-1.07 YEAR 2000 COMPLIANCE

This contract is subject to Year 2000 Compliance for automated devices in the State of California.

Year 2000 compliance for automated devices in the State of California is achieved when embedded functions have or create no logical or mathematical inconsistencies when dealing with dates prior to and beyond 1999. The year 2000 is recognized and processed as a leap year. The product shall operate accurately in the manner in which the product was intended for date operation without requiring manual intervention.

The Contractor shall provide the Engineer a Certificate of Compliance from the manufacturer in conformance with the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications for all automated devices furnished for the project.

5-1.075 BUY AMERICA REQUIREMENTS

Attention is directed to the "Buy America" requirements of the Surface Transportation Assistance Act of 1982 (Section 165) and the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) Sections 1041(a) and 1048(a), and the regulations adopted pursuant thereto. In conformance with the law and regulations, all manufacturing processes for steel and iron materials furnished for incorporation into the work on this project shall occur in the United States; with the exception that pig iron and processed, pelletized and reduced iron ore manufactured outside of the United States may be used in the domestic manufacturing process for such steel and iron materials. The application of coatings, such as epoxy coating, galvanizing, painting, and other coatings that protect or enhance the value of steel or iron materials shall be considered a manufacturing process subject to the "Buy America" requirements.

A Certificate of Compliance conforming to the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications shall be furnished for steel and iron materials. The certificates, in addition to certifying that the materials comply with the specifications, shall specifically certify that all manufacturing processes for the materials occurred in the United States, except for the above exceptions.

The requirements imposed by the law and regulations do not prevent a minimal use of foreign steel and iron materials if the total combined cost of the materials used does not exceed one-tenth of one percent (0.1 percent) of the total contract cost or \$2500, whichever is greater. The Contractor shall furnish the Engineer acceptable documentation of the quantity and value of the foreign steel and iron prior to incorporating the materials into the work.

5-1.08 SUBCONTRACTOR AND DBE RECORDS

The Contractor shall maintain records showing the name and business address of each first-tier subcontractor. The records shall also show the name and business address of every DBE subcontractor, DBE vendor of materials and DBE trucking company, regardless of tier. The records shall show the date of payment and the total dollar figure paid to all of

these firms. DBE prime contractors shall also show the date of work performed by their own forces along with the corresponding dollar value of the work.

Upon completion of the contract, a summary of these records shall be prepared on Form CEM-2402 (F) and certified correct by the Contractor or the Contractor's authorized representative, and shall be furnished to the Engineer. The form shall be furnished to the Engineer within 90 days from the date of contract acceptance. \$10,000 will be withheld from payment until the Form CEM-2402 (F) is submitted. The amount will be returned to the Contractor when a satisfactory Form CEM-2402 (F) is submitted.

Prior to the fifteenth of each month, the Contractor shall submit documentation to the Engineer showing the amount paid to DBE trucking companies listed in the Contractor's DBE information. This monthly documentation shall indicate the portion of the revenue paid to DBE trucking companies which is claimed toward DBE participation. The Contractor shall also obtain and submit documentation to the Engineer showing the amount paid by DBE trucking companies to all firms, including owner-operators, for the leasing of trucks. The DBE who leases trucks from a non-DBE is entitled to credit only for the fee or commission it receives as a result of the lease arrangement. The records must confirm that the amount of credit claimed toward DBE participation conforms with Section 2-1.02, "Disadvantaged Business Enterprise," of these special provisions.

The Contractor shall also obtain and submit documentation to the Engineer showing the truck number, owner's name, California Highway Patrol CA number, and if applicable, the DBE certification number of the owner of the truck for all trucks used during that month for which DBE participation will be claimed. This documentation shall be submitted on Form CEM-2404 (F).

5-1.083 DBE CERTIFICATION STATUS

If a DBE subcontractor is decertified during the life of the project, the decertified subcontractor shall notify the Contractor in writing with the date of decertification. If a subcontractor becomes a certified DBE during the life of the project, the subcontractor shall notify the Contractor in writing with the date of certification. The Contractor shall furnish the written documentation to the Engineer.

Upon completion of the contract, Form CEM-2403 (F) indicating the DBE's existing certification status shall be signed and certified correct by the Contractor. The certified form shall be furnished to the Engineer within 90 days from the date of contract acceptance.

5-1.086 PERFORMANCE OF DBE SUBCONTRACTORS AND SUPPLIERS

The DBEs listed by the Contractor in response to the provisions in Section 2-1.02B, "Submission of DBE Information," and Section 3, "Award and Execution of Contract," of these special provisions, which are determined by the Department to be certified DBEs, shall perform the work and supply the materials for which they are listed, unless the Contractor has received prior written authorization to perform the work with other forces or to obtain the materials from other sources.

Authorization to use other forces or sources of materials may be requested for the following reasons:

- A. The listed DBE, after having had a reasonable opportunity to do so, fails or refuses to execute a written contract, when such written contract, based upon the general terms, conditions, plans and specifications for the project, or on the terms of such subcontractor's or supplier's written bid, is presented by the Contractor.
- B. The listed DBE becomes bankrupt or insolvent.
- C. The listed DBE fails or refuses to perform the subcontract or furnish the listed materials.
- D. The Contractor stipulated that a bond was a condition of executing a subcontract and the listed DBE subcontractor fails or refuses to meet the bond requirements of the Contractor.
- E. The work performed by the listed subcontractor is substantially unsatisfactory and is not in substantial conformance with the plans and specifications, or the subcontractor is substantially delaying or disrupting the progress of the work.
- F. It would be in the best interest of the State.

The Contractor shall not be entitled to any payment for such work or material unless it is performed or supplied by the listed DBE or by other forces (including those of the Contractor) pursuant to prior written authorization of the Engineer.

5-1.09 SUBCONTRACTING

Attention is directed to the provisions in Section 8-1.01, "Subcontracting," of the Standard Specifications, and Section 2, "Proposal Requirements and Conditions," and Section 3, "Award and Execution of Contract," of these special provisions.

Pursuant to the provisions of Section 1777.1 of the Labor Code, the Labor Commissioner publishes and distributes a list of contractors ineligible to perform work as a subcontractor on a public works project. This list of debarred contractors is available from the Department of Industrial Relations web site at:

The provisions in the third paragraph of Section 8-1.01, "Subcontracting," of the Standard Specifications, that the Contractor shall perform with the Contractor's own organization contract work amounting to not less than 50 percent of the original contract price, is not changed by the Federal Aid requirement specified under "Required Contract Provisions Federal-Aid Construction Contracts" in Section 14 of these special provisions that the Contractor perform not less than 30 percent of the original contract work with the Contractor's own organization.

Each subcontract and any lower tier subcontract that may in turn be made shall include the "Required Contract Provisions Federal-Aid Construction Contracts" in Section 14 of these special provisions. This requirement shall be enforced as follows:

- A. Noncompliance shall be corrected. Payment for subcontracted work involved will be withheld from progress payments due, or to become due, until correction is made. Failure to comply may result in termination of the contract.

In conformance with the Federal DBE regulations Sections 26.53(f)(1) and 26.53(f)(2) Part 26, Title 49 CFR:

- A. The Contractor shall not terminate for convenience a DBE subcontractor listed in response to Section 2-1.02B, "Submission of DBE Information," and then perform that work with its own forces, or those of an affiliate without the written consent of the Department, and
- B. If a DBE subcontractor is terminated or fails to complete its work for any reason, the Contractor will be required to make good faith efforts to substitute another DBE subcontractor for the original DBE subcontractor, to the extent needed to meet the contract goal.

The requirement in Section 2-1.02, "Disadvantaged Business Enterprise (DBE)," of these special provisions that DBEs must be certified on the date bids are opened does not apply to DBE substitutions after award of the contract.

5-1.10 PROMPT PROGRESS PAYMENT TO SUBCONTRACTORS

Attention is directed to the provisions in Sections 10262 and 10262.5 of the Public Contract Code and Section 7108.5 of the Business and Professions Code concerning prompt payment to subcontractors.

5-1.102 PROMPT PAYMENT OF WITHHELD FUNDS TO SUBCONTRACTORS

The Contractor shall return all moneys withheld in retention from the subcontractor within 30 days after receiving payment for work satisfactorily completed, even if the other contract work is not completed and has not been accepted in conformance with Section 7-1.17, "Acceptance of Contract," of the Standard Specifications. This requirement shall not be construed to limit or impair any contractual, administrative, or judicial remedies otherwise available to the Contractor or subcontractor in the event of a dispute involving late payment or nonpayment by the Contractor or deficient subcontract performance or noncompliance by a subcontractor.

5-1.11 PARTNERING

The State will promote the formation of a "Partnering" relationship with the Contractor in order to effectively complete the contract to the benefit of both parties. The purpose of this relationship will be to maintain cooperative communication and mutually resolve conflicts at the lowest possible management level.

The Contractor may request the formation of such a "Partnering" relationship by submitting a request in writing to the Engineer after approval of the contract. If the Contractor's request for "Partnering" is approved by the Engineer, scheduling of a "Partnering" workshop, selecting the "Partnering" facilitator and workshop site, and other administrative details shall be as agreed to by both parties.

The costs involved in providing a facilitator and a workshop site will be borne equally by the State and the Contractor. The Contractor shall pay all compensation for the wages and expenses of the facilitator and of the expenses for obtaining the workshop site. The State's share of such costs will be reimbursed to the Contractor in a change order written by the Engineer. Markups will not be added. All other costs associated with the "Partnering" relationship will be borne separately by the party incurring the costs.

The establishment of a "Partnering" relationship will not change or modify the terms and conditions of the contract and will not relieve either party of the legal requirements of the contract.

5-1.12 AREAS FOR CONTRACTOR'S USE

Attention is directed to the provisions in Section 7-1.19, "Rights in Land and Improvements," of the Standard Specifications and these special provisions.

The highway right of way shall be used only for purposes that are necessary to perform the required work. The Contractor shall not occupy the right of way, or allow others to occupy the right of way, for purposes which are not necessary to perform the required work.

No State-owned parcels adjacent to the right of way are available for the exclusive use of the Contractor within the contract limits. The Contractor shall secure, at the Contractor's own expense, areas required for plant sites, storage of equipment or materials, or for other purposes.

No area is available within the contract limits for the exclusive use of the Contractor. However, temporary storage of equipment and materials on State property may be arranged with the Engineer, subject to the prior demands of State maintenance forces and to other contract requirements. Use of the Contractor's work areas and other State-owned property shall be at the Contractor's own risk, and the State shall not be held liable for damage to or loss of materials or equipment located within such areas.

5-1.13 PAYMENTS

Attention is directed to Sections 9-1.06, "Partial Payments," and 9-1.07, "Payment After Acceptance," of the Standard Specifications and these special provisions.

After acceptance of the contract pursuant to the provisions in Section 7-1.17, "Acceptance of Contract," of the Standard Specifications, the amount, if any, payable for a contract item of work in excess of the maximum value for progress payment purposes hereinabove listed for the item, will be included for payment in the first estimate made after acceptance of the contract.

In determining the partial payments to be made to the Contractor, only the following listed materials will be considered for inclusion in the payment as materials furnished but not incorporated in the work:

- A. Pavement markers
- B. Hub cabinet
- C. Camera assemblies
- D. Closed circuit television pole
- E. Fiber optic cable
- F. Fiber optic vault

5-1.14 SOUND CONTROL REQUIREMENTS

Sound control shall conform to the provisions in Section 7-1.01I, "Sound Control Requirements," of the Standard Specifications and these special provisions.

The noise level from the Contractor's operations, between the hours of 7:00 p.m. and 7:00 a.m., shall not exceed 86 dbA at a distance of 15 m. This requirement shall not relieve the Contractor from responsibility for complying with local ordinances regulating noise level outside the limits of the State right of way.

The noise level requirement specified herein shall apply to the equipment on the job or related to the job, including but not limited to trucks, transit mixers or transient equipment that may or may not be owned by the Contractor. The use of loud sound signals shall be avoided in favor of light warnings except those required by safety laws for the protection of personnel.

Full compensation for conforming to the requirements of this section shall be considered as included in the prices paid for the various contract items of work involved and no additional compensation will be allowed therefor.

5-1.15 ENVIRONMENTALLY SENSITIVE AREA

The Contractor's attention is directed to the area designated on the plans as "Environmentally Sensitive Area," and to certain State and Federal regulations which may pertain to such area. This area is to be completely avoided by all parties involved in any work activity in connection with the performance of this contract.

AERIALLY DEPOSITED LEAD

Aerially deposited lead has been detected within the project limits. Aerially deposited lead is defined as lead deposited within unpaved areas, primarily due to vehicle emissions.

Aerially deposited lead has been detected on Route 5 from R19.6 (KP) to R21.3 (KP) and Route 94 from 2.2 (KP) to 6.4 (KP) for all proposed maintenance vehicle pullout areas. The Site Investigation Reports entitled "State Route 5 Between Vesta Street Undercrossing and 30th Street Pedestrian Overcrossing, San Diego, California" and "Lead Investigation State Route 15 Between KP 12.39 and KP 12.81 and State Route 94 Between KP 4.68 and KP 4.81 in San Diego, California," are available for inspection at the Department of Transportation, District 11, San Diego, CA 92110, Telephone No. (619) 688-6635. Materials with total levels of aerially deposited lead above the Total Threshold Limit Concentration (TTLC) of 1000 parts per million (ppm) or soluble levels above the Solubility Threshold Limit Concentration (STLC) of 5 milligrams per liter (mg/L) shall be considered hazardous pursuant to California Hazardous Waste Regulations, Title 22.

The Department has received from the California Department of Toxic Substances Control (DTSC) a variance regarding the use of aerially deposited lead. This project is subject to the conditions of the variance and supplemental amendments. Under the variance, all materials with aerially deposited lead below 1575 milligrams per kilogram (mg/kg) and less than 500 micrograms per liter ($\mu\text{g/L}$) soluble lead, using deionized water, and placed under a 300 mm cover of non-hazardous soil may be placed within the project limits. Materials with aerially deposited lead between 1575 mg/kg and 4150 mg/kg and a solubility of more than 500 $\mu\text{g/L}$, using deionized water, but not higher than 50 milligrams per liter (mg/L), may be placed under pavement within the project limits. Cover materials pursuant to these provisions are soils with less than 500 ppm total and 5 mg/L soluble lead using a citrate buffer. The materials with aerially deposited lead are not regulated under the Federal Resource Conservation and Recovery Act (RCRA). Once the Contractor has completed the placement of material containing aerially deposited lead in conformance with these special provisions and as directed by the Engineer, the Contractor shall have no responsibility for such materials in place. The Department will not consider the Contractor a "generator" of such contaminated soils. Further cleanup, removal or remedial actions for such materials will not be required if handled or disposed of as specified herein.

Attention is directed to "Material With Aerially Deposited Lead" under "Earthwork" of these special provisions regarding the handling of material with aerially deposited lead.

Excavation, reuse, and disposal of material with aerially deposited lead shall be in conformance with all rules and regulations of agencies including, but not limited to, the following:

- A. United States Department of Transportation (USDOT)
- B. United States Environmental Protection Agency (USEPA)
- C. California Department of Health Services
- D. California Environmental Protection Agency (Cal/EPA)
- E. Department of Toxic Substances Control (DTSC), Region 4
- F. Integrated Waste Management Board
- G. Regional Water Quality Control Board (RWQCB), Region 9
- H. State Air Resources Control Board
- I. San Diego County Air Quality Pollution Control District (SDAQPCD)
- J. California Division of Occupational Safety and Health Administration (CALOSHA)

Before starting any work on the project, the Contractor shall submit, for acceptance by the Engineer, a health and safety plan to prevent or minimize exposure to potentially hazardous levels of lead. The health and safety plan shall conform to the requirements of Title 8, California Code of Regulations (CCR), Section 5192 (b)(4)(B) and the Occupational Safety and Health Guidance Manual published by the National Institute of Occupational Safety and Health (NIOSH), Occupational Safety and Health Administration (OSHA), and the United States Environmental Protection Agency (USEPA). In addition, the health and safety plan shall include, but not limited to: identification of key personnel for the project, job hazard analysis for work assignments, summary of risk assessment, air monitoring, personal protective equipment, work zones on-site, decontamination, general safe work practices, security measures, emergency response plans and worker training. The Contractor shall not perform any clearing and grubbing or earthwork within the project limits, other than that specifically authorized in writing by the Engineer, until the plan has been accepted by the Engineer.

The health and safety plan shall utilize monitoring and exposure standards based on Construction Standard Title 8, of the California Code of Regulations (CCR) Section 1532.1 and as a minimum shall contain a description of activities, specific means employed to achieve compliance, report of the technology considered, air monitoring, schedule for implementation of the plan, a work practice program, administrative control schedule, description of arrangements for information transfer among the Contractor's forces concerning potential exposure to lead and other relevant information. The health and safety plan shall include an air monitoring plan that shall include, but not limited to, upwind and downwind perimeter monitoring and a discussion of how the air monitoring will be conducted during the progression of work in those areas designated as containing aerially deposited lead. The air monitoring plan shall meet the requirements of the immediate area's Air Quality

Management District standards, if applicable. The health and safety plan shall be approved by the Contractor's Certified Industrial Hygienist before submission to the Engineer. The health and safety plan shall be submitted to the Engineer at least 15 days prior to beginning work in those areas containing aerially deposited lead.

The Contractor shall prepare a work plan for handling and stockpiling of materials containing hazardous levels of lead. The work plan shall include a plan for confirmatory sampling of any stockpile area after removal of the materials. The plan shall meet USEPA, SW 846, "Test Methods for Evaluating Solid Waste", Volume II: Field Manual Physical/Chemical, Chapter Nine, Section 9.1 requirements for the design and development of the sampling plan, statistical analysis and reporting of the test results. The plan shall be submitted to the Engineer at least 15 days prior to beginning work in areas containing lead.

The Engineer will notify the Contractor of acceptance or rejection of any submitted or revised health and safety plan and work plan in not more than 10 days after submittal of the plan.

Prior to performing work in those areas containing aerially deposited lead, personnel who have no prior training or are not current in their training status, including State personnel, shall complete a safety training program provided by the Contractor. The safety training program shall meet the requirements of Title 8, Section 1532.1.

Safety equipment, training, and medical surveillance required by the Contractor's health and safety plan shall be supplied to State personnel by the Contractor. The number of State personnel will be 5.

Full compensation for conforming to the requirements of this section shall be considered as included in the prices paid for the various contract items of work involved and no additional compensation will be allowed therefor.

SECTION 6. (BLANK)

SECTION 7. (BLANK)

SECTION 8. MATERIALS

SECTION 8-1. MISCELLANEOUS

8-1.01 SUBSTITUTION OF NON-METRIC MATERIALS AND PRODUCTS

Only materials and products conforming to the requirements of the specifications shall be incorporated in the work. When metric materials and products are not available, and when approved by the Engineer, and at no cost to the State, materials and products in the inch-pound (Imperial) system which are of equal quality and of the required properties and characteristics for the purpose intended, may be substituted for the equivalent metric materials and products, subject to the following provisions:

- A. Materials and products shown on the plans or in the special provisions as being equivalent may be substituted for the metric materials and products specified or detailed on the plans.
- B. Before other non-metric materials and products will be considered for use the Contractor shall furnish, at the Contractor's expense, evidence satisfactory to the Engineer that the materials and products proposed for use are equal to or better than the materials and products specified or detailed on the plans. The burden of proof as to the quality and suitability of substitutions shall be upon the Contractor and the Contractor shall furnish necessary information as required by the Engineer. The Engineer will be the sole judge as to the quality and suitability of the substituted materials and products and the Engineer's decision will be final.
- C. When the Contractor elects to substitute non-metric materials and products, including materials and products shown on the plans or in the special provisions as being equivalent, the list of sources of material as specified in Section 6-1.01, "Source of Supply and Quality of Materials," of the Standard Specification shall include a list of substitutions to be made and contract items involved. In addition, for a change in design or details the Contractor shall submit plans and working drawings in conformance with the provisions in Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications.

Unless otherwise specified, the following substitutions of materials and products will be allowed:

SUBSTITUTION TABLE FOR SIZES OF HIGH STRENGTH STEEL FASTENERS

ASTM Designation: A 325M

METRIC SIZE SHOWN ON THE PLANS mm x thread pitch	IMPERIAL SIZE TO BE SUBSTITUTED inch
M16 x 2	5/8
M20 x 2.5	3/4
M22 x 2.5	7/8
M24 x 3	1
M27 x 3	1-1/8
M30 x 3.5	1-1/4
M36 x 4	1-1/2

SUBSTITUTION TABLE FOR PLAIN WIRE REINFORCEMENT, ASTM Designation: A 82

METRIC SIZE SHOWN ON THE PLANS mm ²	US CUSTOMARY UNITS SIZE TO BE SUBSTITUTED inch ² x 100
MW9	W1.4
MW10	W1.6
MW13	W2.0
MW15	W2.3
MW19	W2.9
MW20	W3.1
MW22	W3.5
MW25	W3.9, except W3.5 in piles only
MW26	W4.0
MW30	W4.7
MW32	W5.0
MW35	W5.4
MW40	W6.2
MW45	W6.5
MW50	W7.8
MW55	W8.5, except W8.0 in piles only
MW60	W9.3
MW70	W10.9, except W11.0 in piles only
MW80	W12.4
MW90	W14.0
MW100	W15.5

SUBSTITUTION TABLE FOR BAR REINFORCEMENT

METRIC BAR DESIGNATION NUMBER SHOWN ON THE PLANS	EQUIVALENT IMPERIAL BAR DESIGNATION NUMBER TO BE SUBSTITUTED
13	4
16	5
19	6
22	7
25	8
29	9
32	10
36	11
43	14
57	18

No adjustment will be required in spacing or total number of reinforcing bars due to a difference in minimum yield strength between metric and non-metric bars.

The sizes in the following tables of materials and products are exact conversions of metric sizes of materials and products and are listed as acceptable equivalents:

CONVERSION TABLE FOR SIZES OF:

- (1) STEEL FASTENERS FOR GENERAL APPLICATIONS, ASTM Designation: A 307 or AASHTO Designation: M 314, Grade 36 or 55, and
 (2) HIGH STRENGTH STEEL FASTENERS, ASTM Designation: A 325 or A 449

METRIC SIZE SHOWN ON THE PLANS mm	EQUIVALENT IMPERIAL SIZE inch
6, or 6.35	1/4
8 or 7.94	5/16
10, or 9.52	3/8
11, or 11.11	7/16
13 or 12.70	1/2
14, or 14.29	9/16
16, or 15.88	5/8
19, or 19.05	3/4
22, or 22.22	7/8
24, 25, or 25.40	1
29, or 28.58	1-1/8
32, or 31.75	1-1/4
35, or 34.93	1-3/8
38 or 38.10	1-1/2
44, or 44.45	1-3/4
51, or 50.80	2
57, or 57.15	2-1/4
64, or 63.50	2-1/2
70 or 69.85	2-3/4
76, or 76.20	3
83, or 82.55	3-1/4
89 or 88.90	3-1/2
95, or 95.25	3-3/4
102, or 101.60	4

CONVERSION TABLE FOR NOMINAL THICKNESS OF SHEET METAL

UNCOATED HOT AND COLD ROLLED SHEETS		HOT-DIPPED ZINC COATED SHEETS (GALVANIZED)	
METRIC THICKNESS SHOWN ON THE PLANS	EQUIVALENT US STANDARD GAGE	METRIC THICKNESS SHOWN ON THE PLANS	EQUIVALENT GALVANIZED SHEET GAGE
mm	inch	mm	inch
7.94	0.3125	4.270	0.1681
6.07	0.2391	3.891	0.1532
5.69	0.2242	3.510	0.1382
5.31	0.2092	3.132	0.1233
4.94	0.1943	2.753	0.1084
4.55	0.1793	2.372	0.0934
4.18	0.1644	1.994	0.0785
3.80	0.1495	1.803	0.0710
3.42	0.1345	1.613	0.0635
3.04	0.1196	1.461	0.0575
2.66	0.1046	1.311	0.0516
2.28	0.0897	1.158	0.0456
1.90	0.0747	1.006 or 1.016	0.0396
1.71	0.0673	0.930	0.0366
1.52	0.0598	0.853	0.0336
1.37	0.0538	0.777	0.0306
1.21	0.0478	0.701	0.0276
1.06	0.0418	0.627	0.0247
0.91	0.0359	0.551	0.0217
0.84	0.0329	0.513	0.0202
0.76	0.0299	0.475	0.0187
0.68	0.0269	-----	-----
0.61	0.0239	-----	-----
0.53	0.0209	-----	-----
0.45	0.0179	-----	-----
0.42	0.0164	-----	-----
0.38	0.0149	-----	-----

CONVERSION TABLE FOR WIRE

METRIC THICKNESS SHOWN ON THE PLANS mm	EQUIVALENT USA STEEL WIRE THICKNESS inch	GAGE NO.
6.20	0.244	3
5.72	0.225	4
5.26	0.207	5
4.88	0.192	6
4.50	0.177	7
4.11	0.162	8
3.76	0.148	9
3.43	0.135	10
3.05	0.120	11
2.69	0.106	12
2.34	0.092	13
2.03	0.080	14
1.83	0.072	15
1.57	0.062	16
1.37	0.054	17
1.22	0.048	18
1.04	0.041	19
0.89	0.035	20

CONVERSION TABLE FOR PIPE PILES

METRIC SIZE SHOWN ON THE PLANS mm x mm	EQUIVALENT IMPERIAL SIZE inch x inch
PP 360 x 4.55	NPS 14 x 0.179
PP 360 x 6.35	NPS 14 x 0.250
PP 360 x 9.53	NPS 14 x 0.375
PP 360 x 11.12	NPS 14 x 0.438
PP 406 x 12.70	NPS 16 x 0.500
PP 460 x T	NPS 18 x T"
PP 508 x T	NPS 20 x T"
PP 559 x T	NPS 22 x T"
PP 610 x T	NPS 24 x T"
PP 660 x T	NPS 26 x T"
PP 711 x T	NPS 28 x T"
PP 762 x T	NPS 30 x T"
PP 813 x T	NPS 32 x T"
PP 864 x T	NPS 34 x T"
PP 914 x T	NPS 36 x T"
PP 965 x T	NPS 38 x T"
PP 1016 x T	NPS 40 x T"
PP 1067 x T	NPS 42 x T"
PP 1118 x T	NPS 44 x T"
PP 1219 x T	NPS 48 x T"
PP 1524 x T	NPS 60 x T"

The thickness in inches (T") represents an exact conversion of the metric thickness in millimeters (T).

CONVERSION TABLE FOR STRUCTURAL TIMBER AND LUMBER

METRIC MINIMUM DRESSED DRY, SHOWN ON THE PLANS mm x mm	METRIC MINIMUM DRESSED GREEN, SHOWN ON THE PLANS mm x mm	EQUIVALENT NOMINAL US SIZE inch x inch
19x89	20x90	1x4
38x89	40x90	2x4
64x89	65x90	3x4
89x89	90x90	4x4
140x140	143x143	6x6
140x184	143x190	6x8
184x184	190x190	8x8
235x235	241x241	10x10
286x286	292x292	12x12

CONVERSION TABLE FOR NAILS AND SPIKES

METRIC COMMON NAIL, SHOWN ON THE PLANS Length, mm Diameter, mm	METRIC BOX NAIL, SHOWN ON THE PLANS Length, mm Diameter, mm	METRIC SPIKE, SHOWN ON THE PLANS Length, mm Diameter, mm	EQUIVALENT IMPERIAL SIZE Penny-weight
50.80 2.87	50.80 2.51	————	6d
63.50 3.33	63.50 2.87	————	8d
76.20 3.76	76.20 3.25	76.20 4.88	10d
82.55 3.76	82.55 3.25	82.55 4.88	12d
88.90 4.11	88.90 3.43	88.90 5.26	16d
101.60 4.88	101.60 3.76	101.60 5.72	20d
114.30 5.26	114.30 3.76	114.30 6.20	30d
127.00 5.72	127.00 4.11	127.00 6.68	40d
————	————	139.70 7.19	50d
————	————	152.40 7.19	60d

CONVERSION TABLE FOR IRRIGATION COMPONENTS

METRIC WATER METERS, TRUCK LOADING STANDPIPES, VALVES, BACKFLOW PREVENTERS, FLOW SENSORS, WYE STRAINERS, FILTER ASSEMBLY UNITS, PIPE SUPPLY LINES, AND PIPE IRRIGATION SUPPLY LINES SHOWN ON THE PLANS DIAMETER NOMINAL (DN) mm	EQUIVALENT NOMINAL US SIZE inch
15	1/2
20	3/4
25	1
32	1-1/4
40	1-1/2
50	2
65	2-1/2
75	3
100	4
150	6
200	8
250	10
300	12
350	14
400	16

8-1.02 APPROVED TRAFFIC PRODUCTS

The Department maintains the following list of Approved Traffic Products. The Engineer shall not be precluded from sampling and testing products on the list of Approved Traffic Products.

The manufacturer of products on the list of Approved Traffic Products shall furnish the Engineer a Certificate of Compliance in conformance with the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications for each type of traffic product supplied.

Signing and delineation materials and products shall not be used in the work unless the material or product is on the list of Approved Traffic Products.

Materials and products may be added to the list of Approved Traffic Products if the manufacturer submits a New Product Information Form to the New Product Coordinator at the Transportation Laboratory. Upon a Departmental request for samples, sufficient samples shall be submitted to permit performance of required tests. Approval of materials or products will depend upon compliance with the specifications and tests the Department may elect to perform.

PAVEMENT MARKERS, PERMANENT TYPE

Retroreflective

- A. Apex, Model 921 (100 mm x 100 mm)
- B. Ray-O-Lite, Models SS (100 mm x 100 mm), RS (100 mm x 100 mm) and AA (100 mm x 100 mm)
- C. Stimsonite, Models 88 (100 mm x 100 mm), 911 (100 mm x 100 mm), 953 (70 mm x 114 mm)
- D. 3M Series 290 (89 mm x 100 mm)

Retroreflective With Abrasion Resistant Surface (ARS)

- A. Ray-O-Lite "AA" ARS (100 mm x 100 mm)
- B. Stimsonite, Models 911 (100 mm x 100 mm), 953 (70 mm x 114 mm)
- C. 3M Series 290 (89 mm x 100 mm)

Retroreflective With Abrasion Resistant Surface (ARS)

(Used for recessed applications)

- A. Stimsonite, Model 948 (58 mm x 119 mm)
 - B. Ray-O-Lite, Model 2002 (58 mm x 117 mm)
 - C. Stimsonite, Model 944SB (51 mm x 100 mm)*
 - D. Ray-O-Lite, Model 2004 ARS (51 mm x 100 mm)*
- *For use only in 114 mm wide (older) recessed slots

Non-Reflective For Use With Epoxy Adhesive, 100 mm Round

- A. Apex Universal (Ceramic)
- B. Highway Ceramics, Inc. (Ceramic)

Non-Reflective For Use With Bitumen Adhesive, 100 mm Round

- A. Apex Universal (Ceramic)
- B. Apex Universal, Model 929 (ABS)
- C. Elgin Molded Plastics, "Empco-Lite" Model 900 (ABS)
- D. Highway Ceramics, Inc. (Ceramic)
- E. Hi-Way Safety, Inc., Models P20-2000W and 2001Y (ABS)
- F. Interstate Sales, "Diamond Back" (ABS) and (Polypropylene)
- G. Alpine Products, D-Dot (ABS)
- H. Road Creations, Model RCB4NR (Acrylic)

PAVEMENT MARKERS, TEMPORARY TYPE

Temporary Markers For Long Term Day/Night Use (6 months or less)

- A. Apex Universal, Model 924 (100 mm x 100 mm)
- B. Davidson Plastics Corp., Model 3.0 (100 mm x 100 mm)
- C. Elgin Molded Plastics, "Empco-Lite" Model 901 (100 mm x 100 mm)
- D. Road Creations, Model R41C (100 mm x 100 mm)
- E. Vega Molded Products "Temporary Road Marker" (75 mm x 100 mm)

Temporary Markers For Short Term Day/Night Use (14 days or less)

(For seal coat or chip seal applications, clear protective covers are required)

- A. Apex Universal, Model 932
- B. Davidson Plastics, Models T.O.M., T.R.P.M., and "HH" (High Heat)
- C. Hi-Way Safety, Inc., Model 1280/1281

STRIPING AND PAVEMENT MARKING MATERIALS

Permanent Traffic Striping and Pavement Marking Tape

- A. Advanced Traffic Marking, Series 300 and 400
- B. Brite-Line, Series 1000
- C. Swarco Industries, "Director 35" (For transverse application only)
- D. Swarco Industries, "Director 60"
- E. 3M, "Stamark" Series 380 and 5730
- F. 3M, "Stamark" Series 420 (For transverse application only)

Temporary (Removable) Striping and Pavement Marking Tape (6 months or less)

- A. Brite-Line, Series 100
- B. P.B. Laminations, Aztec, Grade 102
- C. Swarco Industries, "Director-2"
- D. 3M, "Stamark," Series 620
- E. 3M Series A145 Removable Black Line Mask
(Black Tape: For use only on Asphalt Concrete Surfaces)
- F. Advanced Traffic Marking Black "Hide-A-Line"
(Black Tape: For use only on Asphalt Concrete Surfaces)

Preformed Thermoplastic (Heated in place)

- A. Flint Trading, "Premark" and "Premark 20/20 Flex"
- B. Pavemark, "Hotape"

Removable Traffic Paint

- A. Belpro, Series 250/252 and No. 93 Remover

CLASS 1 DELINEATORS

One Piece Driveable Flexible Type, 1700 mm

- A. Carsonite, Curve-Flex CFRM-400
- B. Carsonite, Roadmarker CRM-375
- C. Davidson Plastics, "Flexi-Guide Models 400 and 566"
- D. FlexStake, Model 654TM
- E. GreenLine Models HWD1-66 and CGD1-66
- F. J. Miller Industries, Model JMI-375 (with soil anchor)

Special Use Flexible Type, 1700 mm

- A. Carsonite, "Survivor" (with 450 mm U-Channel base)
- B. FlexStake, Model 604
- C. GreenLine Models HWD and CGD (with 450 mm U-Channel base)
- D. Safe-Hit with 200 mm pavement anchor (SH248-GP1)
- E. Safe-Hit with 380 mm soil anchor (SH248-GP2) and with 450 mm soil anchor (SH248-GP3)

Surface Mount Flexible Type, 1200 mm

- A. Bent Manufacturing Company, "Masterflex" Model MF-180EX-48
- B. Carsonite, "Super Duck II"
- C. FlexStake, Surface Mount, Models 704 and 754TM

CHANNELIZERS

Surface Mount Type, 900 mm

- A. Bent Manufacturing Company, "Masterflex" Models MF-360-36 (Round) and MF-180-36 (Flat)
- B. Carsonite, "Super Duck" (Flat SDF-436, Round SDR-336)
- C. Carsonite, "Super Duck II" Model SDCF203601MB "The Channelizer"
- D. Davidson Plastics, Flex-Guide Models FG300LD and FG300UR
- E. FlexStake, Surface Mount, Models 703 and 753TM
- F. GreenLine, Model SMD-36
- G. Hi-Way Safety, Inc. "Channel Guide Channelizer" Model CGC36
- H. The Line Connection, "Dura-Post" Model DP36-3 (Permanent)
- I. The Line Connection, "Dura-Post" Model DP36-3C (Temporary)
- J. Repo, Models 300 and 400
- K. Safe-Hit, Guide Post, Model SH236SMA

CONICAL DELINEATORS, 1070 mm

(For 700 mm Traffic Cones, see Standard Specifications)

- A. Bent Manufacturing Company "T-Top"
- B. Plastic Safety Systems "Navigator-42"
- C. Roadmaker Company "Stacker"
- D. Traffix Devices "Grabber"

OBJECT MARKERS

Type "K", 450 mm

- A. Carsonite, Model SMD-615
- B. FlexStake, Model 701KM
- C. Repo, Models 300 and 400
- D. Safe-Hit, Model SH718SMA
- E. The Line Connection, Model DP21-4K

Type "K-4" / "Q", 600 mm

(Shown as Type "Q" in the Traffic Manual)

- A. Bent Manufacturing "Masterflex" Model MF-360-24
- B. Carsonite, Super Duck II
- C. FlexStake, Model 701KM
- D. Repo, Models 300 and 400
- E. Safe-Hit, Models SH8 24SMA_WA and SH8 24GP3_WA
- F. The Line Connection, Model DP21-4Q

TEMPORARY RAILING (TYPE K) REFLECTORS AND CONCRETE BARRIER MARKERS

Impactable Type

- A. ARTUK, "FB"
- B. Davidson Plastics, Model PCBM-12
- C. Duraflex Corp., "Flexx 2020" and "Electriflexx"
- D. Hi-Way Safety, Inc., Model GMKRM100

Non-Impactable Type

- A. ARTUK, JD Series
- B. Stimsonite, Model 967 (with 83 mm Acrylic cube corner reflector)
- C. Stimsonite, Model 967LS
- D. Vega Molded Products, Models GBM and JD

THREE BEAM BARRIER MARKERS

(For use to the left of traffic)

- A. Duraflex Corp., "Railrider"
- B. Davidson Plastics, "Mini" (75 mm x 254 mm)

CONCRETE BARRIER DELINEATORS, 400 mm

(For use to the right of traffic. When mounted on top of barrier, places top of reflective element at 1200 mm)

- A. Davidson Plastics, Model PCBM T-16
- B. Safe-Hit, Model SH216RBM

CONCRETE BARRIER-MOUNTED MINI-DRUM (260 mm x 360 mm x 570 mm)

- A. Stinson Equipment Company "SaddleMarker"

SOUND WALL DELINEATOR

(Applied to a vertical surface. Top of reflective element at 1200 mm)

- A. Davidson Plastics, PCBM S-36

GUARD RAILING DELINEATOR

(Top of reflective element at 1200 mm above plane of roadway)

Wood Post Type, 686 mm

- A. Carsonite, Model 427
- B. Davidson Plastics FG 427 and FG 527
- C. FlexStake, Model 102 GR
- D. GreenLine GRD 27
- E. J. Miller Model JMI-375G
- F. Safe-Hit, Model SH227GRD

Steel Post Type

- A. Carsonite, Model CFGR-327 with CFGRBK300 Mounting Bracket

RETROREFLECTIVE SHEETING

Channelizers, Barrier Markers, and Delineators

- A. 3M, High Intensity
- B. Reflexite, PC-1000 Metalized Polycarbonate
- C. Reflexite, AC-1000 Acrylic
- D. Reflexite, AP-1000 Metalized Polyester
- E. Reflexite, AR-1000 Abrasion Resistant Coating
- F. Stimsonite, Series 6200 (For rigid substrate devices only)

Traffic Cones, 330 mm Sleeves

- A. Reflexite SB (Polyester), Vinyl or "TR" (Semi-transparent)

Traffic Cones, 100 mm and 150 mm Sleeves

- A. 3M Series 3840
- B. Reflexite Vinyl, "TR" (Semi-transparent) or "Conformalite"

Barrels and Drums

- A. Reflexite, "Super High Intensity" or "High Impact Drum Sheeting"
- B. 3M Series 3810

Barricades: Type I, Engineer Grade

- A. American Decal, Adcolite
- B. Avery Dennison, 1500 and 1600
- C. 3M, Scotchlite, Series CW

Barricades: Type II, Super Engineer Grade

- A. Avery Dennison, "Fasign" 2500 Series
- B. Kiwalite Type II
- C. Nikkalite 1800 Series

Signs: Type II, Super Engineer Grade

- A. Avery Dennison, "Fasign" 2500 Series
- B. Kiwalite, Type II
- C. Nikkalite 1800 Series

Signs: Type III, High-Intensity Grade

- A. 3M Series 3800
- B. Nippon Carbide, Nikkalite Brand Ultralite Grade II

Signs: Type IV, High-Intensity Prismatic Grade

- A. Stimsonite Series 6200

Signs: Type VII, High-Intensity Prismatic Grade

- A. 3M Series 3900

Signs: Type VI, Roll-Up Signs

- A. Reflexite, Vinyl (Orange), Reflexite "SuperBright" (Fluorescent orange)
- B. 3M Series RS34 (Orange) and RS20 (Fluorescent orange)

SIGN SUBSTRATE FOR CONSTRUCTION AREA SIGNS

Aluminum

Fiberglass Reinforced Plastic (FRP)

- A. Sequentia, "Polyplate"
- B. Fiber-Brite

8-1.03 STATE-FURNISHED MATERIALS

Attention is directed to Section 6-1.02, "State-Furnished Materials," of the Standard Specifications and these special provisions.

The following materials will be furnished to the Contractor:

- A. Padlocks for backflow preventer assembly enclosures, walk gates, and irrigation controller enclosure cabinets.
- B. Model 170 controller assemblies, including controller unit, completely wired controller cabinet, and inductive loop detector sensor units.
- C. Modems
- D. Self-adhesive reflective numbers for numbering electrical equipment.

Completely wired controller cabinets (with auxiliary equipment but without controller unit) will be furnished to the Contractor at the District 11 Signal Laboratory, 7181 Opportunity Road, San Diego, California 92111, telephone No. (858) 467-4010.

The Contractor shall notify the Engineer not less than 48 hours before State-furnished material is to be picked up by the Contractor. A full description of the material and the time the material will be picked up shall be provided.

8-1.04 SLAG AGGREGATE

Air-cooled iron blast furnace slag shall not be used to produce aggregate for:

- A. Structure backfill material.
- B. Reinforced or prestressed portland cement concrete component or structure.
- C. Nonreinforced portland cement concrete component or structure for which a Class 1 Surface Finish is required by the provisions in Section 51-1.18B, "Class 1 Surface Finish," of the Standard Specifications.

Aggregate produced from slag resulting from a steel-making process shall not be used for a highway construction project except for the following items:

- A. Class 2 Aggregate Base.
- B. Asphalt Concrete.

Steel slag to be used to produce aggregate for Class 2 aggregate base shall be crushed so that 100 percent of the material will pass a 19-mm sieve and then shall be control aged for a period of at least 3 months under conditions that will maintain all portions of the stockpiled material at a moisture content in excess of 6 percent of the dry mass of the aggregate.

A supplier of steel slag aggregate shall provide separate stockpiles for controlled aging of the slag. An individual stockpile shall contain not less than 9075 tonnes nor more than 45 350 tonnes of slag. The material in each individual stockpile shall be assigned a unique lot number and each stockpile shall be identified with a permanent system of signs. The supplier shall maintain a permanent record of the dates on which stockpiles are completed and controlled aging begun, of the dates when controlled aging was completed, and of the dates tests were made and the results of these tests. Moisture tests shall be made at least once each week. No credit for aging will be given for the time period covered by tests which show a moisture content of 6 percent or less. The stockpiles and records shall be available to the Engineer during normal working hours for inspection, check testing and review.

The supplier shall notify the Transportation Laboratory, 5900 Folsom Boulevard, Sacramento, California 95819, when each stockpile is completed and controlled aging begun. No more aggregate shall be added to the stockpile unless a new aging period is initiated. A further notification shall be sent when controlled aging is completed.

The supplier shall provide a Certificate of Compliance in conformance with the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications. Each stockpile or portion of a stockpile that is used in the work will be considered a lot. The Certificates of Compliance shall state that the steel slag aggregate has been aged in a stockpile for at least 3 months at a moisture content in excess of 6 percent of the dry mass of the aggregate.

Each delivery of aggregate containing steel slag for use as Class 2 aggregate base shall be accompanied by a delivery tag for each load which will identify the lot of material by stockpile number, where the slag was aged, and the date that the stockpile was completed and controlled aging begun.

Air-cooled iron blast furnace slag or natural aggregate may be blended in proper combinations with steel slag aggregate to produce the specified gradings, for those items for which steel slag aggregate is permitted, unless otherwise provided.

Aggregate containing slag shall meet the applicable quality requirements for the items in which the aggregate is used.

The combined slag aggregate shall conform to the specified grading for the item in which it is used. The grading will be determined by California Test 202, modified by California Test 105 when there is a difference in specific gravity of 0.2 or more between the coarse and fine portion of the aggregate or between blends of different aggregates.

No aggregate produced from slag shall be placed within 0.3-m, measured in any direction, of a non-cathodically protected pipe or structure unless the aggregate is incorporated in portland cement concrete pavement, in asphalt concrete, or in treated base.

When slag is used as aggregate in asphalt concrete, the K_c factor requirements, as determined by California Test 303, will not apply.

If steel slag aggregates are used to make asphalt concrete, there shall be no other aggregates used in the mixture, except that up to 50 percent of the material passing the 4.75-mm sieve may consist of iron blast furnace slag aggregates or natural aggregates, or a combination thereof. If iron blast furnace aggregates or natural aggregates or a combination thereof are used in the mix, each type of aggregate shall be fed to the drier at a uniform rate. The rate of feed of each type of aggregate shall be maintained within 10 percent of the amount set. Adequate means shall be provided for controlling and checking the accuracy of the feeder.

In addition to the requirements of Section 39-3.01, "Storage," of the Standard Specifications, steel slag aggregate shall be stored separately from iron blast furnace slag aggregate and each type of slag aggregate shall also be stored separately from natural aggregate.

Asphalt concrete produced from more than one of the following shall not be placed in the same layer: steel slag aggregates, iron blast furnace slag aggregates, natural aggregates or any combination thereof. Once a type of aggregate or aggregates is selected, it shall not be changed without prior approval by the Engineer.

If steel slag aggregates are used to produce asphalt concrete, and if the specific gravity of a compacted stabilometer test specimen is in excess of 2.40, the quantity of asphalt concrete to be paid for will be reduced. The stabilometer test specimen will be fabricated in conformance with the procedures in California Test 304 and the specific gravity of the specimen will be determined in conformance with Method C of California Test 308. The pay quantity of asphalt concrete will be determined by multiplying the quantity of asphalt concrete placed in the work by 2.40 and dividing the result by the specific gravity of the compacted stabilometer test specimen. Such reduction in quantity will be determined and applied as often as is necessary to ensure accurate results as determined by the Engineer.

SECTION 8-2. CONCRETE

8-2.01 PORTLAND CEMENT CONCRETE

Portland cement concrete shall conform to the provisions in Section 90, "Portland Cement Concrete," of the Standard Specifications and these special provisions.

Unless the use of a mineral admixture is prohibited, whenever the word "cement" is used in the Standard Specifications or the special provisions, it shall be understood to mean "cementitious material" when both of the following conditions are met:

- A. The cement content of portland cement concrete is specified, and
- B. Section 90, "Portland Cement Concrete," of the Standard Specifications is referenced.

Unless otherwise specified, a Type C accelerating chemical admixture conforming to the requirements in ASTM Designation: C 494 may be used in portland cement concrete for precast steam cured concrete members.

Section 90-1.01, "Description," of the Standard Specifications is amended to read:

90-1.01 DESCRIPTION

- Portland cement concrete shall be composed of cementitious material, fine aggregate, coarse aggregate, admixtures if used, and water, proportioned and mixed as specified in these specifications.
- Unless otherwise specified, cementitious material to be used in portland cement concrete shall conform to the provisions for cement and mineral admixtures in Section 90-2, "Materials," and shall be either: 1) "Type IP (MS) Modified" cement or 2) a combination of "Type II Modified" portland cement and mineral admixture.
- Concrete for each portion of the work shall comply with the provisions for the Class, cementitious material content in kilograms per cubic meter, 28-day compressive strength, minor concrete or commercial quality concrete, as shown on the plans or specified in these specifications or the special provisions.
 - Class 1 concrete shall contain not less than 400 kg of cementitious material per cubic meter.
 - Class 2 concrete shall contain not less than 350 kg of cementitious material per cubic meter.
 - Class 3 concrete shall contain not less than 300 kg of cementitious material per cubic meter.
 - Class 4 concrete shall contain not less than 250 kg of cementitious material per cubic meter.
 - Minor concrete shall contain not less than 325 kg of cementitious material per cubic meter unless otherwise specified in these specifications or the special provisions.

- Unless otherwise designated on the plans or specified in these specifications or the special provisions, the amount of cementitious material used per cubic meter of concrete in structures or portions of structures shall conform to the following:

Use	Cementitious Material Content (kg/m ³)
Concrete which is designated by compressive strength:	
Deck slabs and slab spans of bridges	400 min., 475 max.
Roof sections of exposed top box culverts	400 min., 475 max.
Other portions of structures	350 min., 475 max.
Concrete not designated by compressive strength:	
Deck slabs and slab spans of bridges	400 min.
Roof sections of exposed top box culverts	400 min.
Prestressed members	400 min.
Seal courses	400 min.
Other portions of structures	350 min.
Concrete for precast members	350 min., 550 max.

- Whenever the 28-day compressive strength shown on the plans is greater than 25 MPa, the concrete shall be considered to be designated by compressive strength. If the plans show a 28-day compressive strength which is 31 MPa or greater, an additional 7 days will be allowed to obtain the specified strength. The 28-day compressive strengths shown on the plans which are 25 MPa or less are shown for design information only and are not to be considered a requirement for acceptance of the concrete.
 - Concrete designated by compressive strength shall be proportioned such that the concrete will conform to the strength shown on the plans or specified in the special provisions.
 - The Contractor shall determine the mix proportions for all concrete except pavement concrete. The Engineer will determine the mix proportions for pavement concrete.
 - Before using concrete for which the mix proportions have been determined by the Contractor, or in advance of revising those mix proportions, the Contractor shall submit in writing to the Engineer a copy of the mix design.
 - Compliance with cementitious material content requirements will be verified in conformance with procedures described in California Test 518 for cement content. For testing purposes, mineral admixture shall be considered to be cement. Batch proportions shall be adjusted as necessary to produce concrete having the specified cementitious material content.
 - If any concrete used in the work has a cementitious material content, consisting of cement, mineral admixture, or cement plus mineral admixture, which is less than the minimum required for the work, the concrete shall be removed. However, if the Engineer determines that the concrete is structurally adequate, the concrete may remain in place and the Contractor shall pay to the State \$0.55 for each kilogram of cement, mineral admixture, or cement plus mineral admixture which is less than the minimum required for the work. The Department may deduct the amount from moneys due, or that may become due, the Contractor under the contract. The deductions will not be made unless the difference between the contents required and those actually provided exceeds the batching tolerances permitted by Section 90-5, "Proportioning." No deductions for cementitious material content will be made based on the results of California Test 518.
 - The requirements of the preceding paragraph shall not apply to minor concrete or commercial quality concrete.
 - Concrete for which the mix proportions are determined either by the Contractor or the Engineer shall conform to the requirements of this Section 90.

The first paragraph in Section 90-2.01, "Portland Cement," of the Standard Specifications is amended to read:

90-2.01 PORTLAND CEMENT

- Unless otherwise specified, portland cement shall be either "Type IP (MS) Modified" cement or "Type II Modified" portland cement.
 - "Type IP (MS) Modified" cement shall conform to the specifications for Type IP (MS) cement in ASTM Designation: C 595, and shall be comprised of an intimate mixture of Type II cement and not more than 25 percent of a mineral admixture. The type and minimum amount of mineral admixture used in the manufacture of "Type IP (MS) Modified" cement shall be in conformance with the provisions in Section 90-4.08, "Required Use of Mineral Admixtures."
 - "Type II Modified" portland cement shall conform to the requirements for Type II portland cement in ASTM Designation: C 150.
 - In addition, "Type IP (MS) Modified" cement and "Type II Modified" portland cement shall conform to the following requirements:

- A. The cement shall not contain more than 0.60 percent by mass of alkalis, calculated as the percentage of Na₂O plus 0.658 times the percentage of K₂O, when determined by either direct intensity flame photometry or by the atomic absorption method. The instrument and procedure used shall be qualified as to precision and accuracy in conformance with the requirements in ASTM Designation: C 114.
- B. The autoclave expansion shall not exceed 0.50 percent.
- C. Mortar, containing the cement to be used and Ottawa sand, when tested in conformance with California Test 527, shall not expand in water more than 0.010 percent and shall not contract in air more than 0.048 percent except that when cement is to be used for precast prestressed concrete piling, precast prestressed concrete members or steam cured concrete products, the mortar shall not contract in air more than 0.053 percent.

The second paragraph in Section 90-2.01, "Portland Cement," of the Standard Specifications is amended to read:

- Type III and Type V portland cements shall conform to the requirements in ASTM Designation: C 150, and the additional requirements listed above for Type II Modified portland cement, except that when tested in conformance with California Test 527, mortar containing Type III portland cement shall not contract in air more than 0.075 percent.

The third paragraph in Section 90-2.01, "Portland Cement," of the Standard Specifications is deleted.

The twelfth paragraph in Section 90-2.02, "Aggregates," of the Standard Specifications is deleted.

The first paragraph in Section 90-2.03, "Water," of the Standard Specifications is amended to read:.

90-2.03 WATER

- In conventionally reinforced concrete work, the water for curing, for washing aggregates, and for mixing shall be free from oil and shall not contain more than 1000 parts per million of chlorides as Cl, nor more than 1300 parts per million of sulfates as SO₄. In prestressed concrete work, the water for curing, for washing aggregates, and for mixing shall be free from oil and shall not contain more than 650 parts per million of chlorides as Cl, nor more than 1300 parts per million of sulfates as SO₄. In no case shall the water contain an amount of impurities that will cause either: 1) a change in the setting time of cement of more than 25 percent when tested in conformance with the requirements in ASTM Designation: C 191 or ASTM Designation: C 266 or 2) a reduction in the compressive strength of mortar at 14 days of more than 5 percent, when tested in conformance with the requirements in ASTM Designation: C 109, when compared to the results obtained with distilled water or deionized water, tested in conformance with the requirements in ASTM Designation: C 109.

The following section is added to Section 90-2, "Materials," of the Standard Specifications:

90-2.04 ADMIXTURE MATERIALS

- Admixture materials shall conform to the requirements in the following ASTM Designations:
 - A. Chemical Admixtures—ASTM Designation: C 494.
 - B. Air-entraining Admixtures—ASTM Designation: C 260.
 - C. Calcium Chloride—ASTM Designation: D 98.
 - D. Mineral Admixtures—Coal fly ash, raw or calcined natural pozzolan as specified in ASTM Designation: C618. Silica fume conforming to the requirements in ASTM Designation: C1240, with reduction of mortar expansion of 80 percent, minimum, using the cement from the proposed mix design.
- Mineral admixtures shall be used in conformance with the provisions in Section 90-4.08, "Required Use of Mineral Admixtures."

Section 90-4.02, "Materials," of the Standard Specifications is amended to read:

90-4.02 MATERIALS

- Admixture materials shall conform to the provisions in Section 90-2.04, "Admixture Materials."

Section 90-4.05, "Optional Use of Chemical Admixtures," of the Standard Specifications is amended to read:

90-4.05 OPTIONAL USE OF CHEMICAL ADMIXTURES

- The Contractor will be permitted to use Type A or F, water-reducing; Type B, retarding; or Type D or G, water-reducing and retarding admixtures as described in ASTM Designation: C 494 to conserve cementitious material or to facilitate concrete construction application subject to the following conditions:

- A. When a water-reducing admixture or a water-reducing and retarding admixture is used, the cementitious material content specified or ordered may be reduced by a maximum of 5 percent by mass except that the resultant cementitious material content shall be not less than 300 kg/m³.
- B. When a reduction in cementitious material content is made, the dosage of admixture used shall be the dosage used in determining approval of the admixture.

Section 90-4.07, "Optional Use of Air-entraining Admixtures," of the Standard Specifications is amended to read:

90-4.07 OPTIONAL USE OF AIR-ENTRAINING ADMIXTURES

- When air-entrainment has not been specified or ordered by the Engineer, the Contractor will be permitted to use an air-entraining admixture to facilitate the use of any construction procedure or equipment provided that the average air content, as determined by California Test 504, of 3 successive tests does not exceed 4 percent and no single test value exceeds 5.5 percent. If the Contractor elects to use an air-entraining admixture in concrete for pavement, the Contractor shall so indicate at the time the Contractor designates the source of aggregate as provided in Section 40-1.015, "Cement Content."

Section 90-4.08, "Required Use of Mineral Admixtures," of the Standard Specifications is amended to read:

90-4.08 REQUIRED USE OF MINERAL ADMIXTURES

- Unless otherwise specified, mineral admixture shall be combined with cement to make cementitious material for use in portland cement concrete.
- The calcium oxide content of mineral admixtures shall not exceed 10 percent and the available alkali, as sodium oxide equivalent, shall not exceed 1.5 percent when determined in conformance with the requirements in ASTM Designation: C618.
- The amounts of cement and mineral admixture used in cementitious material for portland cement concrete shall be sufficient to satisfy the minimum cementitious material content requirements specified in Section 90-1.01, "Description," or Section 90-4.05, "Optional Use of Chemical Admixtures," and shall conform to the following:

- A. The minimum amount of cement shall not be less than 75 percent by mass of the specified minimum cementitious material content.
- B. The minimum amount of mineral admixture to be combined with cement shall be determined using one of the following criteria:
 1. When the calcium oxide content of a mineral admixture, as determined in conformance with the requirements in ASTM Designation: C618 and the provisions in Section 90-2.04, "Admixture Materials," is equal to or less than 2 percent by mass, the amount of mineral admixture shall not be less than 15 percent by mass of the total amount of cementitious material to be used in the mix.
 2. When the calcium oxide content of a mineral admixture, as determined in conformance with the requirements in ASTM Designation: C618 and the provisions in Section 90-2.04, "Admixture Materials," is greater than 2 percent, the amount of mineral admixture shall not be less than 25 percent by mass of the total amount of cementitious material to be used in the mix.
 3. When a mineral admixture is used, which conforms to the provisions for silica fume in Section 90-2.04, "Admixture Materials," the amount of mineral admixture shall not be less than 10 percent by mass of the total amount of cementitious material to be used in the mix.
- C. If more than the required amount of cementitious material is used, the additional cementitious material in the mix may be either cement, a mineral admixture conforming to the provisions in Section 90-2.04, "Admixture Materials," or a combination of both; however, the maximum total amount of mineral admixture shall not exceed 35 percent by mass of the total amount of cementitious material to be used in the mix. Where Section 90-1.01, "Description," specifies a maximum cementitious content in kilograms per cubic meter, the total mass of cement and mineral admixture per cubic meter shall not exceed the specified maximum cementitious material content.

Section 90-4.09, "Optional Use of Mineral Admixtures," of the Standard Specifications is deleted.

Section 90-4.11, "Storage, Proportioning, and Dispensing of Mineral Admixtures," of the Standard Specifications is amended to read:

90-4.11 STORAGE, PROPORTIONING, AND DISPENSING OF MINERAL ADMIXTURES

- Mineral admixtures shall be protected from exposure to moisture until used. Sacked material shall be piled to permit access for tally, inspection, and identification for each shipment.
- Adequate facilities shall be provided to assure that mineral admixtures meeting the specified requirements are kept separate from other mineral admixtures in order to prevent any but the specified mineral admixtures from entering the work. Safe and suitable facilities for sampling mineral admixtures shall be provided at the weigh hopper or in the feed line immediately in advance of the hopper.
- Mineral admixtures shall be incorporated into concrete using equipment conforming to the requirements for cement weigh hoppers, and charging and discharging mechanisms in ASTM Designation: C 94, in Section 90-5.03, "Proportioning," and in this Section 90-4.11.
- When interlocks are required for cement and mineral admixture charging mechanisms by Section 90-5.03A, "Proportioning for Pavement," and cement and mineral admixtures are weighed cumulatively, their charging mechanisms shall be interlocked to prevent the introduction of mineral admixture until the mass of cement in the cement weigh hopper is within the tolerances specified in Section 90-5.02, "Proportioning Devices."
- Mineral admixture used in concrete for exposed surfaces of like elements of a structure shall be from the same source and of the same percentage.

Section 90-5.02, "Proportioning Devices," of the Standard Specifications is amended to read:

90-5.02 PROPORTIONING DEVICES

- Weighing, measuring or metering devices used for proportioning materials shall conform to the provisions in Section 9-1.01, "Measurement of Quantities," and this Section 90-5.02. In addition, automatic weighing systems used shall comply with the provisions for automatic proportioning devices in Section 90-5.03A, "Proportioning for Pavement." These automatic devices shall be automatic to the extent that the only manual operation required for proportioning the aggregates, cement, and mineral admixture for one batch of concrete is a single operation of a switch or starter.
- Proportioning devices shall be tested at the expense of the Contractor as frequently as the Engineer may deem necessary to insure their accuracy.
- Weighing equipment shall be insulated against vibration or movement of other operating equipment in the plant. When the plant is in operation, the mass of each batch of material shall not vary from the mass designated by the Engineer by more than the tolerances specified herein.
- Equipment for cumulative weighing of aggregate shall have a zero tolerance of ± 0.5 percent of the designated total batch mass of the aggregate. For systems with individual weigh hoppers for the various sizes of aggregate, the zero tolerance shall be ± 0.5 percent of the individual batch mass designated for each size of aggregate. Equipment for cumulative weighing of cement and mineral admixtures shall have a zero tolerance of ± 0.5 percent of the designated total batch mass of the cement and mineral admixture. Equipment for weighing cement or mineral admixture separately shall have a zero tolerance of ± 0.5 percent of their designated individual batch masses. Equipment for measuring water shall have a zero tolerance of ± 0.5 percent of its designated mass or volume.
- The mass indicated for a batch of material shall not vary from the preselected scale setting by more than the following:
 - A. Aggregate weighed cumulatively shall be within 1.0 percent of the designated total batch mass of the aggregate. Aggregates weighed individually shall be within 1.5 percent of their respective designated batch masses.
 - B. Cement shall be within 1.0 percent of its designated batch mass. When weighed individually, mineral admixture shall be within 1.0 percent of its designated batch mass. When mineral admixture and cement are permitted to be weighed cumulatively, cement shall be weighed first to within 1.0 percent of its designated batch mass, and the total for cement and mineral admixture shall be within 1.0 percent of the sum of their designated batch masses.
 - C. Water shall be within 1.5 percent of its designated mass or volume.
- Each scale graduation shall be approximately 0.001 of the total capacity of the scale. The capacity of scales for weighing cement, mineral admixture, or cement plus mineral admixture and aggregates shall not exceed that of commercially available scales having single graduations indicating a mass not exceeding the maximum permissible mass variation above, except that no scale shall be required having a capacity of less than 500 kg, with 0.5 kg graduations.

Section 90-5.03, "Proportioning," excluding Section 90-5.03A, "Proportioning for Pavement," of the Standard Specifications is amended to read:

90-5.03 PROPORTIONING

- Proportioning shall consist of dividing the aggregates into the specified sizes, each stored in a separate bin, and combining them with cement, mineral admixture, and water as provided in these specifications. Aggregates shall be proportioned by mass.

- At the time of batching, aggregates shall have been dried or drained sufficiently to result in a stable moisture content such that no visible separation of water from aggregate will take place during transportation from the proportioning plant to the point of mixing. In no event shall the free moisture content of the fine aggregate at the time of batching exceed 8 percent of its saturated, surface-dry mass.

- Should separate supplies of aggregate material of the same size group, but of different moisture content or specific gravity or surface characteristics affecting workability, be available at the proportioning plant, withdrawals shall be made from one supply exclusively and the materials therein completely exhausted before starting upon another.

- Bulk "Type IP (MS) Modified" cement that conforms to the provisions in Section 90-2.01, "Portland Cement," shall be weighed in an individual hopper and shall be kept separate from the aggregates until the ingredients are released for discharge into the mixer.

- Bulk cement to be blended with mineral admixture for use in portland cement concrete for pavement and structures may be weighed in separate, individual weigh hoppers or may be weighed in the same weigh hopper with mineral admixture and shall be kept separate from the aggregates until the ingredients are released for discharge into the mixer. If the cement and mineral admixture are weighed cumulatively, the cement shall be weighed first.

- When cement and mineral admixtures are weighed in separate weigh hoppers, the weigh systems for the proportioning of the aggregate, the cement, and the mineral admixture shall be individual and distinct from other weigh systems. Each weigh system shall be equipped with a hopper, a lever system, and an indicator to constitute an individual and independent material weighing device. The cement and the mineral admixture shall be discharged into the mixer simultaneously with the aggregate.

- The scale and weigh hopper for bulk weighing cement, mineral admixture, and cement plus mineral admixture shall be separate and distinct from the aggregate weighing equipment.

- When the source of an aggregate is changed for concrete structures, the Contractor shall adjust the mix proportions and submit in writing to the Engineer a copy of the mix design before using such aggregates. When the source of an aggregate is changed for other concrete, the Engineer shall be allowed sufficient time to adjust the mix and such aggregates shall not be used until necessary adjustments are made.

- For batches with a volume of one cubic meter or more, the batching equipment shall conform to one of the following combinations:

- A. Separate boxes and separate scale and indicator for weighing each size of aggregate.
- B. Single box and scale indicator for all aggregates.
- C. Single box or separate boxes and automatic weighing mechanism for all aggregates.

- In order to check the accuracy of batch masses, the gross mass and tare mass of batch trucks, truck mixers, truck agitators, and non-agitating hauling equipment shall be determined when ordered by the Engineer. The equipment shall be weighed at the Contractor's expense on scales designated by the Engineer.

Section 90-5.03A, "Proportioning for Pavement," of the Standard Specifications is amended to read:

90-5.03A PROPORTIONING FOR PAVEMENT

- Aggregates and bulk cement, mineral admixture, and cement plus mineral admixture for use in pavement shall be proportioned by mass by means of automatic proportioning devices of approved type conforming to the provisions in this Section 90-5.03A.

- The Contractor shall install and maintain in operating condition an electrically actuated moisture meter that will indicate, on a readily visible scale, changes in the moisture content of the fine aggregate as it is batched within a sensitivity of 0.5 percent by mass of the fine aggregate.

- The batching of cement, mineral admixture, or cement plus mineral admixture and aggregate shall be interlocked so that a new batch cannot be started until all weigh hoppers are empty, the proportioning devices are within zero tolerance, and the discharge gates are closed. The interlock shall permit no part of the batch to be discharged until all aggregate hoppers and the cement and mineral admixture hoppers or the cement plus mineral admixture hopper are charged with masses which are within the tolerances specified in Section 90-5.02, "Proportioning Devices."

- The discharge gate on the cement and mineral admixture hoppers or the cement plus mineral admixture hopper shall be designed to permit regulating the flow of cement, mineral admixture or cement plus mineral admixture into the aggregate as directed by the Engineer.

- When separate weigh boxes are used for each size of aggregate, the discharge gates shall permit regulating the flow of each size of aggregate as directed by the Engineer.
- Material discharged from the several bins shall be controlled by gates or by mechanical conveyors. The means of withdrawal from the several bins, and of discharge from the weigh box, shall be interlocked so that not more than one bin can discharge at a time, and that the weigh box cannot be tripped until the required quantity from each of the several bins has been deposited therein. Should a separate weigh box be used for each size of aggregate, all may be operated and discharged simultaneously.
- When the discharge from the several bins is controlled by gates, each gate shall be actuated automatically so that the required mass is discharged into the weigh box, after which the gate shall automatically close and lock.
- The automatic weighing system shall be designed so that all proportions required may be set on the weighing controller at the same time.

The third paragraph in Section 90-6.01, "General," of the Standard Specifications is amended to read:

- Concrete shall be homogeneous and thoroughly mixed. There shall be no lumps or evidence of undispersed cement, mineral admixture, or cement plus mineral admixture.

The third and fourth paragraphs in Section 90-6.02, "Machine Mixing," of the Standard Specifications are amended to read:

- The batch shall be so charged into the mixer that some water will enter in advance of cementitious materials and aggregates. All water shall be in the drum by the end of the first one-fourth of the specified mixing time.
- Cementitious materials shall be batched and charged into the mixer by means that will not result either in loss of cementitious materials due to the effect of wind, or in accumulation of cementitious materials on surfaces of conveyors or hoppers, or in other conditions which reduce or vary the required quantity of cementitious material in the concrete mixture.

The sixth paragraph in Section 90-6.02, "Machine Mixing," of the Standard Specifications is amended to read:

- The total elapsed time between the intermingling of damp aggregates and all cementitious materials and the start of mixing shall not exceed 30 minutes.

The seventh through tenth paragraphs in Section 90-6.03, "Transporting Mixed Concrete," of the Standard Specifications are amended to read:

- When a truck mixer or agitator is used for transporting concrete to the delivery point, discharge shall be completed within 1.5 hours, or before 250 revolutions of the drum or blades, whichever comes first, after the introduction of the cement to the aggregates. Under conditions contributing to quick stiffening of the concrete, or when the temperature of the concrete is 30°C, or above, a time less than 1.5 hours may be required.
- When non-agitating hauling equipment is used for transporting concrete to the delivery point, discharge shall be completed within one hour after the addition of the cement to the aggregates. Under conditions contributing to quick stiffening of the concrete, or when the temperature of the concrete is 30°C, or above, the time between the introduction of cement to the aggregates and discharge shall not exceed 45 minutes.
- Each load of concrete delivered at the job site shall be accompanied by a weight certificate showing the mix identification number, non-repeating load number, date and time at which the materials were batched, the total amount of water added to the load and for transit-mixed concrete, the reading of the revolution counter at the time the truck mixer is charged with cement. This weight certificate shall also show the actual scale masses (kilograms) for the ingredients batched. Theoretical or target batch masses shall not be used as a substitute for actual scale masses.
- Weight certificates shall be provided in printed form, or if approved by the Engineer, the data may be submitted in electronic media. Electronic media shall be presented in a tab-delimited format on 90 mm diskette with a capacity of at least 1.4 megabytes. Captured data, for the ingredients represented by each batch shall be LFCR (one line, separate record) with allowances for sufficient fields to satisfy the amount of data required by these specifications.
- The Contractor may furnish a weight certificate that is accompanied by a separate certificate which lists the actual batch masses or measurements for a load of concrete provided that both certificates are 1) imprinted with the same non-repeating load number that is unique to the contract and 2) delivered to the job site with the load.
- Weight certificates furnished by the Contractor shall conform to the provisions in Section 9-1.01, "Measurement of Quantities," of the Standard Specifications.

Section 90-6.05, "Hand-Mixing," of the Standard Specifications is amended to read:

90-6.05 HAND-MIXING

- Hand-mixed concrete shall be made in batches not more than one-fourth cubic meter and shall be mixed on a watertight, level platform. The proper amount of coarse aggregate shall be measured in measuring boxes and spread on the platform and the fine aggregate shall be spread on this layer, the 2 layers being not more than 0.3 meters in total depth. On this mixture shall be spread the dry cement and mineral admixture and the whole mass turned no fewer than 2 times dry; then sufficient clean water shall be added, evenly distributed, and the whole mass again turned no fewer than 3 times, not including placing in the carriers or forms.

The table in the first paragraph in Section 90-6.06, "Amount of Water and Penetration," of the Standard Specifications is replaced with the following table:

Type of Work	Nominal Penetration (mm)	Maximum Penetration (mm)
Concrete pavement	0-25	40
Non-reinforced concrete facilities	0-35	50
Reinforced concrete structures:		
Sections over 300 mm thick	0-35	65
Sections 300 mm thick or less	0-50	75
Concrete placed under water	75-100	115
Cast-in-place concrete piles	65-90	100

The first paragraph following the table of penetration ranges in Section 90-6.06, "Amount of Water and Penetration," of the Standard Specifications is amended to read:

- The amount of free water used in concrete shall not exceed 183 kg/m^3 , plus 20 kg for each required 100 kg of cementitious material in excess of 325 kg/m^3 .

The fourth paragraph in Section 90-6.06, "Amount of Water and Penetration," of the Standard Specifications is amended to read:

- Where there are adverse or difficult conditions which affect the placing of concrete, the above specified penetration and free water content limitations may be exceeded providing the Contractor is granted permission by the Engineer in writing to increase the cementitious material content per cubic meter of concrete. The increase in water and cementitious material shall be at a ratio not to exceed 30 kg of water per added 100 kg of cementitious material per cubic meter. The cost of additional cementitious material and water added under these conditions shall be at the Contractor's expense and no additional compensation will be allowed therefor.

Section 90-9.01, "General," of the Standard Specifications is amended to read:

90-9.01 GENERAL

- Concrete compressive strength requirements consist of a minimum strength which must be attained before various loads or stresses are applied to the concrete and, for concrete designated by strength, a minimum strength at the age of 28 days or at the age otherwise allowed in Section 90-1.01, "Description." The various strengths required are specified in these specifications or are shown on the plans.

- The compressive strength of concrete will be determined from test cylinders which have been fabricated from concrete sampled in conformance with California Test 539. Test cylinders will be molded and initial field cured in conformance with California Test 540. Test cylinders will be cured and tested after receipt at the testing laboratory in conformance with California Test 521. A strength test shall consist of the average strength of 2 cylinders fabricated from material taken from a single load of concrete, except that, if any cylinder should show evidence of improper sampling, molding, or testing, that cylinder shall be discarded and the strength test shall consist of the strength of the remaining cylinder.

- When concrete compressive strength is specified as a prerequisite to applying loads or stresses to a concrete structure or member, test cylinders for other than steam cured concrete will be cured in conformance with Method 1 of California Test 540. The compressive strength of concrete determined for these purposes will be evaluated on the basis of individual tests.

- When concrete is designated by 28-day compressive strength rather than by cementitious material content, the concrete strength to be used as a basis for acceptance of other than steam cured concrete will be determined from cylinders cured in conformance with Method 1 of California Test 540. If the result of a single compressive strength test at the maximum age specified or allowed is below the specified strength but is 95 percent or more of the specified strength, the Contractor shall, at the Contractor's expense, make corrective changes, subject to approval by the Engineer, in the mix proportions or in the concrete fabrication procedures, before placing additional concrete, and shall pay to the State \$14 for each in-place cubic meter of concrete represented by the deficient test. If the result of a single compressive strength test at the maximum age specified or allowed is below 95 percent of the specified strength, but is 85 percent or more of the specified strength, the Contractor shall make the corrective changes specified above, and shall pay to the State \$20 for each in place cubic meter of concrete represented by the deficient test. In addition, such corrective changes shall be made when the compressive strength of concrete tested at 7 days indicates, in the judgment of the Engineer, that the concrete will not attain the required compressive strength at the maximum age specified or allowed. Concrete represented by a single test which indicates a compressive strength of less than 85 percent of the specified 28-day compressive strength will be rejected in conformance with the provisions in Section 6-1.04, "Defective Materials."

- If the test result indicates that the compressive strength at the maximum curing age specified or allowed is below the specified strength, but 85 percent or more of the specified strength, payments to the State as required above shall be made, unless the Contractor, at the Contractor's expense, obtains and submits evidence acceptable to the Engineer that the strength of the concrete placed in the work meets or exceeds the specified 28-day compressive strength. If the test result indicates a compressive strength at the maximum curing age specified or allowed below 85 percent, the concrete represented by that test will be rejected, unless the Contractor, at the Contractor's expense, obtains and submits evidence acceptable to the Engineer that the strength and quality of the concrete placed in the work are acceptable. If the evidence consists of tests made on cores taken from the work, the cores shall be obtained and tested in conformance with the requirements in ASTM Designation: C 42.

- No single compressive strength test shall represent more than 250 m³.

- When a precast concrete member is steam cured, the compressive strength of the concrete will be determined from test cylinders which have been handled and stored in conformance with Method 3 of California Test 540. The compressive strength of steam cured concrete will be evaluated on the basis of individual tests representing specific portions of production. When the concrete is designated by 28-day compressive strength rather than by cementitious material content, the concrete shall be considered to be acceptable whenever its compressive strength reaches the specified 28-day compressive strength provided that strength is reached in not more than the maximum number of days specified or allowed after the member is cast.

- If concrete is specified by compressive strength, then materials, mix proportions, mixing equipment, and procedures proposed for use shall be prequalified prior to placement of the concrete. Prequalification shall be accomplished by the submission of acceptable certified test data or trial batch reports by the Contractor. Prequalification data shall be based on the use of materials, mix proportions, mixing equipment, procedures, and size of batch proposed for use in the work.

- Certified test data, in order to be acceptable, must indicate that not less than 90 percent of at least 20 consecutive tests exceed the specified strength at the maximum number of cure days specified or allowed, and none of those tests are less than 95 percent of specified strength. Strength tests included in the data shall be the most recent tests made on concrete of the proposed mix design and all shall have been made within one year of the proposed use of the concrete.

- Trial batch test reports, in order to be acceptable, must indicate that the average compressive strength of 5 consecutive concrete cylinders, taken from a single batch, at not more than 28 days (or the maximum age allowed) after molding shall be at least 4 MPa greater than the specified 28-day compressive strength, and no individual cylinder shall have a strength less than the specified strength at the maximum age specified or allowed. Data contained in the report shall be from trial batches which were produced within one year of the proposed use of specified strength concrete in the project. Whenever air-entrainment is required, the air content of trial batches shall be equal to or greater than the air content specified for the concrete without reduction due to tolerances.

- Tests shall be performed in conformance with either the appropriate California Test methods or the comparable ASTM test methods. Equipment employed in testing shall be in good condition and shall be properly calibrated. If the tests are performed during the life of the contract, the Engineer shall be notified sufficiently in advance of performing the tests in order to witness the test procedures.

- The certified test data and trial batch test reports shall include the following information:

- A. Date of mixing.
- B. Mixing equipment and procedures used.
- C. The size of batch in cubic meters and the mass, type and source of ingredients used.
- D. Penetration of the concrete.
- E. The air content of the concrete if an air-entraining admixture is used.
- F. The age at time of testing and strength of concrete cylinders tested.

- Certified test data and trial batch test reports shall be signed by an official of the firm which performed the tests.
- When approved by the Engineer, concrete from trial batches may be used in the work at locations where concrete of a lower quality is required and the concrete will be paid for as the type or class of concrete required at that location.
- After materials, mix proportions, mixing equipment, and procedures for concrete have been prequalified for use, additional prequalification by testing of trial batches will be required prior to making changes which, in the judgment of the Engineer, could result in a lowering of the strength of the concrete below that specified.
- The Contractor's attention is directed to the time required to test trial batches. The Contractor shall be responsible for production of trial batches at a sufficiently early date so that the progress of the work is not delayed.
- When precast concrete members are manufactured at the plant of an established manufacturer of precast concrete members, the mix proportions of the concrete shall be determined by the Contractor, and a trial batch and prequalification of the materials, mix proportions, mixing equipment, and procedures will not be required.

Section 90-10.02A, "Portland Cement," of the Standard Specifications is renamed "Cementitious Material" and is amended to read:

90-10.02A CEMENTITIOUS MATERIAL

- Cementitious material shall conform to the provisions in Section 90-1.01, "Description." Compressive strength requirements consist of a minimum strength which must be attained before various loads or stresses are applied to the concrete and, for concrete designated by strength, a minimum strength at the age of 28 days or at the age otherwise allowed in Section 90-1.01, "Description." The various strengths required are specified in these specifications or are shown on the plans.

The fifth paragraph in Section 90-10.02B, "Aggregate," of the Standard Specifications is deleted.

Section 90-10.03, "Production," of the Standard Specifications is amended to read:

90-10.03 PRODUCTION

- Cementitious material, water, aggregate, and admixtures shall be stored, proportioned, mixed, transported, and discharged in conformance with recognized standards of good practice, which will result in concrete that is thoroughly and uniformly mixed, which is suitable for the use intended, and which conforms to provisions specified herein. Recognized standards of good practice are outlined in various industry publications such as those issued by American Concrete Institute, AASHTO, or California Department of Transportation.
- The cementitious material content of minor concrete shall conform to the provisions in Section 90-1.01, "Description."
- The amount of water used shall result in a consistency of concrete conforming to the provisions in Section 90-6.06, "Amount of Water and Penetration." Additional mixing water shall not be incorporated into the concrete during hauling or after arrival at the delivery point, unless authorized by the Engineer.
- Discharge of ready-mixed concrete from the transporting vehicle shall be made while the concrete is still plastic and before stiffening occurs. An elapsed time of 1.5 hours (one hour in non-agitating hauling equipment), or more than 250 revolutions of the drum or blades, after the introduction of the cementitious material to the aggregates, or a temperature of concrete of more than 32°C will be considered as conditions contributing to the quick stiffening of concrete. The Contractor shall take whatever action is necessary to eliminate quick stiffening, except that the addition of water will not be permitted.
- The required mixing time in stationary mixers shall be not less than 50 seconds or more than 5 minutes.
- The minimum required revolutions at mixing speed for transit-mixed concrete shall be not less than that recommended by the mixer manufacturer, and shall be increased, if necessary, to produce thoroughly and uniformly mixed concrete.
- Each load of ready-mixed concrete shall be accompanied by a weight certificate which shall be delivered to the Engineer at the discharge location of the concrete, unless otherwise directed by the Engineer. The weight certificate shall be clearly marked with the date and time of day when the load left the batching plant and, if hauled in truck mixers or agitators, the time the mixing cycle started.
- A Certificate of Compliance conforming to the provisions in Section 6-1.07, "Certificates of Compliance," shall be furnished to the Engineer, prior to placing minor concrete from a source not previously used on the contract, stating that minor concrete to be furnished meets contract requirements, including minimum cementitious material content specified.

8-2.02 CEMENT AND WATER CONTENT

All concrete for use in structures shall contain not less than 375 kg of cement per cubic meter and shall be air-entrained as provided in Section 90-4, "Admixtures," of the Standard Specifications. The air content at time of mixing and prior to placing shall be 3 percent \pm one percent.

The amount of free water used in concrete shall not exceed 204 kg/m³, plus 20 kg for each required 100 kg of cement in excess of 375 kg/m³.

SECTION 8-3. WELDING

8-3.01 WELDING ELECTRODES

Flux core welding electrodes conforming to the requirements of AWS A5.20 E6XT-4 or E7XT-4 shall not be used to perform any type of welding for this project.

8-3.02 WELDING QUALITY CONTROL

Welding quality control shall conform to the requirements in the AWS welding codes, the Standard Specifications, and these special provisions.

Welding quality control shall apply when any work is welded in conformance with the provisions in Section 49, "Piling," Section 52, "Reinforcement," Section 55, "Steel Structures," Section 56-1, "Overhead Sign Structures," Section 75-1.035, "Bridge Joint Restrainer Units," or Section 86-2.04, "Standards, Steel Pedestals and Posts," of the Standard Specifications.

Wherever reference is made to the following AWS welding codes in the Standard Specifications, on the plans or in these special provisions, the year of adoption for these codes shall be as listed:

AWS Code	Year of Adoption
D1.1	1998
D1.4	1992
D1.5	1995
D1.5 (metric only)	1996

All requirements of the AWS welding codes shall apply unless specified otherwise in the Standard Specifications, on the plans or in these special provisions. Wherever the abbreviation AWS is used, it shall be equivalent to the abbreviations ANSI/AWS or ANSI/AASHTO/AWS.

The welding of all fracture critical members (FCMs) shall conform to the provisions specified in the Fracture Control Plan (FCP) and herein.

The Contractor shall designate in writing a welding Quality Control Manager (QCM). The QCM shall be responsible directly to the Contractor for the quality of welding, including materials and workmanship, performed by the Contractor and all subcontractors.

The QCM shall be the sole individual responsible to the Contractor for submitting, receiving, and approving all correspondence, required submittals, and reports to and from the Engineer.

The QCM shall not be employed or compensated by any subcontractor, or by other persons or entities hired by subcontractors, who will provide other services or materials for the project. The QCM may be an employee of the Contractor.

Welding inspection personnel or nondestructive testing (NDT) firms to be used in the work shall not be employed or compensated by any subcontractor, or by other persons or entities hired by subcontractors, who will provide other services or materials for the project, except for the following conditions:

- A. The welding is performed at a permanent fabrication facility which is certified under the AISC Quality Certification Program, Category Cbr, Major Steel Bridges.
- B. The welding is performed at a permanent fabrication facility which is certified under the AISC Quality Certification Program, Category Sbd, Conventional Steel Building Structures. This condition shall apply only for work welded in conformance with the provisions in Section 56-1, "Overhead Sign Structures," or Section 86-2.04, "Standards, Steel Pedestals and Posts," of the Standard Specifications.

For welding performed at such certified facilities, the inspection personnel or NDT firms may be employed or compensated by the fabrication facility performing the welding.

Prior to submitting the Welding Quality Control Plan (WQCP) required herein, a pre-welding meeting between the Engineer, Contractor and any welding subcontractors or entities hired by these subcontractors to be used in the work, shall be held to discuss the requirements for the WQCP.

Prior to performing any welding, the Contractor shall submit to the Engineer, in conformance with the provisions in Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications, 3 copies of a separate WQCP for each item of work for which welding is to be performed. As a minimum, each WQCP shall include the following:

- A. The name of the welding firm and the NDT firm to be used;
- B. A manual prepared by the NDT firm that shall include equipment, testing procedures, code of safe practices, the Written Practice of the NDT firm, and the names, qualifications and documentation of certifications for all personnel to be used;
- C. The name of the QCM and the names, qualifications and documentation of certifications for all Quality Control (QC) Inspectors and Assistant Quality Control Inspectors to be used;
- D. An organizational chart showing all QC personnel and their assigned QC responsibilities;
- E. The methods and frequencies for performing all required quality control procedures, including QC inspection forms to be used, as required by the specifications including:
 - 1. all visual inspections;
 - 2. all NDT including radiographic geometry, penetrameter and shim selection, film quality, film processing, radiograph identification and marking system, and film interpretation and reports; and
 - 3. calibration procedures and calibration frequency for all NDT equipment;
- F. A system for the identification and tracking of all welds, NDT and any required repairs, and a procedure for the reinspection of any repaired welds. The system shall have provisions for 1) permanently identifying each weld and the person who performed the weld, 2) placing all identification and tracking information on each radiograph and 3) a method of reporting nonconforming welds to the Engineer;
- G. Standard procedures for performing noncritical repair welds. Noncritical repair welds are defined as welds to deposit additional weld beads or layers to compensate for insufficient weld size and to fill limited excavations that were performed to remove unacceptable edge or surface discontinuities, rollover or undercut. The depth of these excavations shall not exceed 65 percent of the specified weld size;
- H. The welding procedure specification (WPS), including documentation of all supporting Procedure Qualification Record (PQR) tests performed, and the name of the testing laboratory who performed the tests, to verify the acceptability of the WPS. The submitted WPS shall be within the allowable period of effectiveness;
- I. Documentation of all certifications for welders for each weld process and position that will be used. Certifications shall list the electrodes used, test position, base metal and thickness, tests performed, and the witnessing authority. All certifications shall be within the allowable period of effectiveness; and
- J. One copy each of all AWS welding codes and the FCP which are applicable to the welding to be performed. These codes and the FCP shall become the permanent property of the Department.
- K. Example forms to be used for Certificates of Compliance, daily production logs, and daily reports.

The Engineer shall have 10 working days to review the WQCP submittal after a complete plan has been received. No welding shall be performed until the WQCP is approved in writing by the Engineer. Should the Engineer fail to complete the review within this time allowance and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of the delay in reviewing the WQCP, the delay will be considered a right of way delay in conformance with the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

An amended WQCP or addendum shall be submitted to, and approved in writing by the Engineer, for any proposed revisions to the approved WQCP. An amended WQCP or addendum will be required for any revisions to the WQCP, including but not limited to a revised WPS, additional welders, changes in NDT firms or procedures, QC or NDT personnel, or updated systems for tracking and identifying welds. The Engineer shall have 3 working days to complete the review of the amended WQCP or addendum. Work that is affected by any of the proposed revisions shall not be performed until the amended WQCP or addendum has been approved. Should the Engineer fail to complete the review within this time allowance and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of the delay in reviewing the amended WQCP or addendum, the delay will be considered a right of way delay in conformance with the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

After final approval of the WQCP, amended WQCP, or addendum, the Contractor shall submit 7 copies to the Engineer of each of these approved documents.

It is expressly understood that the Engineer's approval of the Contractor's WQCP shall not relieve the Contractor of any responsibility under the contract for the successful completion of the work in conformity with the requirements of the plans and specifications. The Engineer's approval shall not constitute a waiver of any of the requirements of the plans and specifications nor relieve the Contractor of any obligation thereunder, and defective work, materials and equipment may be rejected notwithstanding approval of the WQCP.

A daily production log for welding shall be kept by the QCM for each day that welding is performed. The log shall clearly indicate the locations of all welding, and shall include the welders' names, amount of welding performed, any problems or deficiencies discovered, and any testing or repair work performed, at each location. The daily report from each Quality Control Inspector shall also be included in the log.

The following items shall be included in a Welding Report that is to be submitted to the Engineer within 7 days following the performance of any welding:

- A. Reports of all visual weld inspections and NDT;
- B. Radiographs and radiographic reports, and other required NDT reports;
- C. Documentation that the Contractor has evaluated all radiographs and other nondestructive tests, corrected all rejectable deficiencies, and all repaired welds have been reexamined by the required NDT and found acceptable; and
- D. Daily production log.

All radiographic envelopes shall have clearly written on the outside of the envelope the following information: name of the QCM, name of the nondestructive testing firm, name of the radiographer, date, contract number, complete part description, and all included weld numbers or a report number, as detailed in the WQCP. In addition, all innerleaves shall have clearly written on them the part description and all included weld numbers, as detailed in the WQCP.

All reports regarding NDT, including radiographs, shall be signed by both the NDT technician and the person that performed the review, and then submitted directly to the QCM for review and signature prior to submittal to the Engineer. Corresponding names shall be clearly printed or typewritten next to all signatures.

The Engineer will review the Welding Report to determine if the Contractor is in conformance with the WQCP. Except for steel piling, the Engineer shall be allowed 7 days to review the report and respond in writing after a complete Welding Report has been received. The review time for steel piling shall be as specified in "Piling" of these special provisions. Prior to receiving notification from the Engineer of the Contractor's conformance with the WQCP, the Contractor may encase in concrete or cover any welds for which a Welding Report has been submitted. However, should the Contractor elect to encase or cover those welds prior to receiving notification from the Engineer, it is expressly understood that the Contractor shall not be relieved of the responsibility for incorporating material in the work that conforms to the requirements of the plans and specifications. Any material not conforming to these requirements will be subject to rejection. Should the Contractor elect to wait to encase or cover any welds pending notification by the Engineer, and should the Engineer fail to complete the review and provide notification within this time allowance, and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of the delay in notification, the delay will be considered a right of way delay in conformance with the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

Sections 6.1.2 through 6.1.4.3 of AWS D 1.1, Sections 7.1.1 and 7.1.2 of AWS D 1.4, and Sections 6.1.1.1 through 6.1.3.3 of AWS D 1.5 are replaced with the following:

Quality Control (QC) shall be the responsibility of the Contractor. As a minimum, the Contractor shall perform inspection and testing prior to welding, during welding and after welding as specified in this section and additionally as necessary to ensure that materials and workmanship conform to the requirements of the contract documents.

The Quality Control (QC) Inspector shall be the duly designated person who performs inspection, testing, and quality matters for all welding.

Quality Assurance (QA) is the prerogative of the Engineer. The QA Inspector is the duly designated person who acts for and on behalf of the Engineer.

All QC Inspectors shall be responsible for quality control acceptance or rejection of materials and workmanship, and shall be currently certified as AWS Certified Welding Inspectors (CWI) in conformance with the requirements in AWS QC1, "Standard and Guide for Qualification of Welding Inspectors."

The QC Inspector may be assisted by an Assistant QC Inspector provided that this individual is currently certified as an AWS Certified Associate Welding Inspector (CAWI) in conformance with the requirements in AWS QC1, "Standard and Guide for Qualification of Welding Inspectors," or has equivalent qualifications. The QC Inspector shall monitor the Assistant QC Inspector's work, and shall be responsible for signing all reports.

When the term "Inspector" is used without further qualification, it shall refer to the QC Inspector.

Section 6.14.6, "Personnel Qualification," of AWS D 1.1, Section 7.7.6, "Personnel Qualification," of AWS D 1.4, and Section 6.1.3.4, "Personnel Qualification," of AWS D 1.5 are replaced with the following:

Personnel performing NDT shall be qualified in conformance with the requirements in the current edition of the American Society for Nondestructive Testing (ASNT) Recommended Practice No. SNT-TC-1A and the Written Practice of the NDT firm. The Written Practice of the NDT firm shall meet or exceed the requirements of the current edition of the ASNT Recommended Practice No. SNT-TC-1A. Only individuals who are 1) qualified for NDT Level II, or 2) Level III

technicians who have been directly certified by the ASNT and are authorized to perform the work of Level II technicians, shall perform NDT, review the results, and prepare the written reports.

Section 6.5.4, "Scope of Examination," of AWS D 1.1 and Section 7.5.4 of AWS D 1.4 are replaced with the following:

The QC Inspector shall inspect and approve the joint preparation, assembly practice, welding techniques, and performance of each welder, welding operator, and tack welder to make certain that the applicable requirements of this code and the approved WPS are met.

Section 6.5.4 of AWS D 1.5 is replaced with the following:

The QC Inspector shall inspect and approve the joint preparation, assembly practice, welding techniques, and performance of each welder, welding operator, and tack welder to make certain that the applicable requirements of this code and the approved WPS are met. The QC Inspector shall examine the work to make certain that it meets the requirements of section 3 and 9.21. The size and contour of welds shall be measured using suitable gages. Visual inspection for cracks in welds and base metal, and for other discontinuities should be aided by strong light magnifiers, or such other devices as may be helpful. Acceptance criteria different from those specified in this code may be used when approved by the Engineer.

The Engineer shall have the authority to verify the qualifications or certifications of any welder, Quality Control Inspector, or NDT personnel to specified levels by retests or other means.

A sufficient number of QC Inspectors shall be provided to ensure continuous inspection when any welding is being performed. Continuous inspection, as a minimum, shall include (1) having QC Inspectors continually present on all shifts when any welding is being performed, or (2) having a QC Inspector within such close proximity of all welding operations that inspections by the QC Inspector of each operation, at each welding location, shall not lapse for a period exceeding 30 minutes.

Inspection and approval of the joint preparation, assembly practice, welding techniques, and performance of each welder, welding operator, and tack welder shall be documented by the QC Inspector on a daily basis for each day that welding is performed.

The QC Inspector shall provide reports to the QCM on a daily basis for each day that welding is performed.

Except for noncritical weld repairs, base metal repairs, or any other type of repairs not submitted in the WQCP, the Engineer shall be notified immediately in writing when any welding problems or deficiencies are discovered and also of the proposed repair procedures to correct them. The Engineer shall have 5 working days to review these procedures. No remedial work shall begin until the repair procedures are approved in writing by the Engineer. Should the Engineer fail to complete the review within this time allowance and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of the delay in reviewing the proposed repair procedures, the delay will be considered a right of way delay in conformance with the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

When joint details that are not prequalified by the applicable AWS codes are proposed for use in the work, all welders using these details shall perform a qualification test plate using the approved WPS variables and the joint detail to be used in production. The test plate shall be the maximum thickness to be used in production. The test plate shall be mechanically or radiographically tested as directed by the Engineer. Mechanical and radiographic testing and acceptance criteria shall be as specified in the applicable AWS codes.

The period of effectiveness for a welder's or welding operator's qualification shall be a maximum of 3 years for the same weld process, welding position, and weld type. A valid qualification at the beginning of work on a contract will be acceptable for the entire period of the contract, as long as the welder's work remains satisfactory.

All qualification tests for welders, welding operators, and WPSs used in welding operations will be witnessed by the Engineer.

Section 6.6.5, "Nonspecified Nondestructive Testing Other Than Visual," of AWS D 1.1, Section 6.6.5 of AWS D 1.4 and Section 6.6.5 of AWS D 1.5 shall not apply.

All required repair work to correct welding deficiencies, whether discovered by the required visual inspection or NDT, or by additional NDT directed by the Engineer, and any associated delays or expenses caused to the Contractor by performing these repairs, shall be at the Contractor's expense.

At the completion of all welding, the QCM shall sign and furnish to the Engineer, a Certificate of Compliance in conformance with the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications for each item of work for which welding was performed. The certificate shall state that all of the materials and workmanship incorporated in the work, and all required tests and inspections of this work, have been performed in conformance with the details shown on the plans and the provisions of the Standard Specifications and these special provisions.

Full compensation for conforming to the requirements of this section shall be considered as included in the contract prices paid for the various items of work involved and no additional compensation will be allowed therefor.

SECTION 9. DESCRIPTION OF BRIDGE WORK

South Chollas Creek Bridge, Bridge No. 57-0436

Install eight 27C conduits atop of box girder.

Rigel Street Undercrossing, Bridge No. 57-0437

Install eight 27C conduits atop box girder.

Route 5/15 Separation, Bridge No. 57-0438

Install eight 27C conduits atop box girder.

Chollas Creek Bridge, Bridge No. 57-0473

Install two conduits for MDCS between 57-0473L and 57-0473R.

Las Chollas Bridge, Bridge No. 57-323K

Install one conduit for MDCS.

28th Street Undercrossing, Bridge No. 57-0359

Install two conduits inside box girder.

32nd Street Undercrossing, Bridge No. 57-0361

Install two conduits inside box girder.

Las Chollas Creek Bridge, Bridge No. 57-0107L

Install two conduits inside girder.

Las Chollas Creek Bridge No. 57-495S

Install two 27 C conduit inside box girder.

Coronado Bay Bridge, Bridge No. 57-0857

Install one conduit on the pier girder from Piers 2 to 30 and in walkway from piers 31 to 33.

SECTION 10. CONSTRUCTION DETAILS

SECTION 10-1. GENERAL

10-1.00 CONSTRUCTION PROJECT INFORMATION SIGNS

Before any major physical construction work readily visible to highway users is started on this contract, the Contractor shall furnish and erect 2 Type 2 Construction Project Information signs at the locations designated by the Engineer.

The signs and overlays shall be of a type and material consistent with the estimated time of completion of the project and shall conform to the details shown on the plans.

The sign letters, border and the Department's construction logos shall conform to the colors (non-reflective) and details shown on the plans, and shall be on a white background (non-reflective). The colors blue and orange shall conform to PR Color Number 3 and Number 6, respectively, as specified in the Federal Highway Administration's Color Tolerance Chart.

The sign message to be used for fund types shall consist of the following, in the order shown:

FEDERAL HIGHWAY TRUST FUNDS
STATE HIGHWAY FUNDS

The sign message to be used for type of work shall consist of the following:

HIGHWAY IMPROVEMENT

The sign message to be used for the Year of Completion of Project Construction will be furnished by the Engineer. The Contractor shall furnish and install the "Year" sign overlay within 10 working days of notification of the year date to be used.

The letter sizes to be used shall be as shown on the plans. The information shown on the signs shall be limited to that shown on the plans.

The signs shall be kept clean and in good repair by the Contractor.

Upon completion of the work, the signs shall be removed and disposed of outside the highway right of way in conformance with the provisions in Section 7-1.13 of the Standard Specifications.

Full compensation for furnishing, erecting, maintaining, and removing and disposing of the construction project information signs shall be considered as included in the contract lump sum price paid for construction area signs and no additional compensation will be allowed therefor.

10-1.01 ORDER OF WORK

Order of work shall conform to the provisions in Section 5-1.05, "Order of Work," of the Standard Specifications and these special provisions.

A first order of work shall be the construction of the contract items of work, as shown on the project plans, incorporated into WPCP as minimum requirement and critical temporary control measures. Attention is directed to "Water Pollution Control" for critical temporary control measures.

Work on Route 75 shall be performed after the completion of work on Route 5, Route 15, and Route 94.

Existing facilities that are to remain, and that are within those areas where jacking and drilling, trenching, and other earthwork operations are to be performed, shall be located and marked prior to performing the aforementioned operations.

Full compensation for checking and marking existing facilities shall be considered as included in the contract prices paid per meter for the various electrical items involved, and no additional compensation will be allowed therefor.

Immediately after fiber optic work and maintenance vehicle pullout installation are completed in a location, temporary erosion control shall be applied in areas that are to receive replacement landscape.

Not less than 30 days prior to planting the plants, the Contractor shall furnish the Engineer a statement from the vendor that the order for the plants required for this contract, including inspection plants, has been received and accepted by the vendor. The statement from the vendor shall include the names, sizes, and quantities of plants ordered and the anticipated date of delivery.

The Contractor shall place orders for replacement plants with the vendor at the appropriate time so that the roots of the replacement plants are not in a root-bound condition.

Attention is directed to "Irrigation Systems Functional Test" of these special provisions, regarding restrictions for planting operations.

Clearing, grubbing, and earthwork operations shall not be performed in areas where existing irrigation facilities are to remain in place until existing irrigation facilities have been checked for proper operation in conformance with the provisions in "Highway Planting and Irrigation Systems" of these special provisions.

Attention is directed to Section 20-5.027B, "Wiring Plans and Diagrams," of the Standard Specifications regarding submittal of working drawings.

10-1.02 WATER POLLUTION CONTROL

Water pollution control work shall conform to the provisions in Section 7-1.01G, "Water Pollution," of the Standard Specifications and these special provisions.

This project shall conform to the requirements of Permit No. CAS029998 issued by the State Water Resources Regional Water Quality Control Board. This permit, hereafter referred to as the "Permit," regulates storm water discharges associated with construction activities.

Water pollution control work shall conform to the requirements in the Construction Contractor's Guide and Specifications of the Caltrans Storm Water Quality Handbooks, dated April 1997, and addenda thereto issued up to and including the date of advertisement of the project, hereafter referred to as the "Handbook." Copies of the Handbook may be obtained from the Department of Transportation, Material Operations Branch, Publication Distribution Unit, 1900 Royal Oaks Drive, Sacramento, California 95815, Telephone: (916) 445-3520.

Copies of the Handbook and the Permit are also available for review at Caltrans District Office, District Construction Liaison Office, 2829 Juan Street, San Diego, California 92110, Telephone (619) 688-6635.

The Contractor shall know and fully comply with the applicable provisions of the Handbook, Permit, and Federal, State, and local regulations that govern the Contractor's operations and storm water discharges from both the project site and areas of disturbance outside the project limits during construction. The Contractor shall maintain a copy of the Permit at the project site and shall make the Permit available during construction.

Unless arrangements for disturbance of areas outside the project limits are made by the Department and made part of the contract, it is expressly agreed that the Department assumes no responsibility whatsoever to the Contractor or property owner with respect to any arrangements made between the Contractor and property owner to allow disturbance of areas outside the project limits.

The Contractor shall be responsible for the costs and for liabilities imposed by law as a result of the Contractor's failure to comply with the provisions set forth in this section "Water Pollution Control", including but not limited to, compliance with the applicable provisions of the Handbook, Permit and Federal, State and local regulations. For the purposes of this paragraph, costs and liabilities include, but are not limited to, fines, penalties, and damages whether assessed against the State or the Contractor, including those levied under the Federal Clean Water Act and the State Porter Cologne Water Quality Act.

In addition to the remedies authorized by law, some of the money due the Contractor under the contract, as determined by the Department, may be retained by the State of California until disposition has been made of the costs and liabilities.

The retention of money due the Contractor shall be subject to the following:

- A. The Department will give the Contractor 30 days notice of the Department's intention to retain funds from partial payments which may become due to the Contractor prior to acceptance of the contract. Retention of funds from payments made after acceptance of the contract may be made without prior notice to the Contractor.
- B. No retention of additional amounts out of partial payments will be made if the amount to be retained does not exceed the amount being withheld from partial payments pursuant to Section 9-1.06, "Partial Payments," of the Standard Specifications.
- C. If the Department has retained funds and it is subsequently determined that the State is not subject to the costs and liabilities in connection with the matter for which the retention was made, the Department shall be liable for interest on the amount retained at the legal rate of interest for the period of the retention.

Conformance with the provisions of this section "Water Pollution Control" shall not relieve the Contractor from the Contractor's responsibilities, as provided in Section 7, "Legal Relations and Responsibilities," of the Standard Specifications.

At reasonable times and upon presentation of credentials and other documents as may be required by law, the Contractor shall allow authorized agents of the California Regional Water Quality Control Board, State Water Resources Control Board, United States Environmental Protection Agency and the local storm water management agency to:

- A. Enter upon the construction site and the Contractor's facilities pertinent to the work;
- B. Have access to and copy records that must be kept as specified in the Permit;
- C. Inspect the construction site and related soil stabilization practices and sediment control measures; and
- D. Sample or monitor for the purpose of ensuring compliance with the Permit.

The Contractor shall notify the Engineer immediately upon request from the regulatory agencies to enter, inspect, sample, monitor or otherwise access the project site or the Contractor's records.

STORM WATER POLLUTION PREVENTION PLAN PREPARATION, APPROVAL AND UPDATES

As part of the water pollution control work, a Storm Water Pollution Prevention Plan, hereafter referred to as the "SWPPP," is required for this contract. The SWPPP shall conform to the provisions in Section 7-1.01G, "Water Pollution," of the Standard Specifications, the requirements in the Handbook, the requirements of the Permit, and these special provisions. Upon the Engineer's approval of the SWPPP, the SWPPP shall be deemed to fulfill the provisions in Section 7-1.01G of the Standard Specifications for development and submittal of a Water Pollution Control Program.

No work having potential to cause water pollution, as determined by the Engineer, shall be performed until the SWPPP has been approved by the Engineer.

Within 30 days after the approval of the contract, the Contractor shall submit 5 copies of the SWPPP to the Engineer. The Engineer will have 15 days to review the SWPPP. If revisions are required, as determined by the Engineer, the Contractor shall revise and resubmit the SWPPP within 15 days of receipt of the Engineer's comments. The Engineer will have 15 days to review the revisions. Upon the Engineer's approval of the SWPPP, 3 additional copies of the SWPPP, incorporating the required changes, shall be submitted to the Engineer. In order to allow construction activities to proceed, the Engineer may conditionally approve the SWPPP while minor revisions are being completed.

The SWPPP shall identify pollution sources that may adversely affect the quality of storm water discharges associated with the project and shall identify water pollution control measures, hereafter referred to as control measures, to be constructed, implemented, and maintained in order to reduce to the extent feasible pollutants in storm water discharges from the construction site both during and after construction is completed under this contract.

The SWPPP shall incorporate control measures in the following categories:

- A. Soil stabilization practices;
- B. Sediment control practices;
- C. Sediment tracking control practices;
- D. Wind erosion control practices; and
- E. Non-storm water management and waste management and disposal control practices.

Specific objectives and minimum requirements for each category of control measures are contained in the Handbook.

The Contractor shall consider the objectives and minimum requirements presented in the Handbook for each of the above categories. When minimum requirements are listed for any category, the Contractor shall incorporate into the SWPPP and implement on the project, one or more of the listed minimum controls required in order to meet the pollution control objectives for the category. In addition, the Contractor shall consider other control measures presented in the Handbook and shall incorporate into the SWPPP and implement on the project the control measures necessary to meet the objectives of the SWPPP. The Contractor shall document the selection process in conformance with the procedure specified in the Handbook.

The following contract items of work, where shown on the project plans, shall be incorporated in the SWPPP as critical temporary control measures: Temporary gravel bags, temporary silt fence, and temporary fiber rolls. The Contractor shall consider other control measures to supplement the critical temporary control measures when necessary to meet the pollution control objectives of the SWPPP.

The SWPPP shall include, but not limited to, the following items as described in the Handbook and Permit:

- A. Source Identification;
- B. Erosion and Sediment Controls;
- C. Non-Storm Water Management;
- D. Waste Management and Disposal;
- E. Maintenance, Inspection and Repair;
- F. Training;
- G. List of Contractors and Subcontractors;
- H. Post-Construction Storm Water Management;
- I. Preparer;
- J. A copy of the Notice of New Construction (NONC) submitted by the Department for this project;
- K. Copy of the Local Permit;
- L. BMP Consideration Checklist;
- M. SWPPP Checklist;
- N. Schedule of Values; and
- O. Water Pollution Control Drawings.

The Contractor shall amend the SWPPP, graphically and in narrative form, whenever there is a change in construction activities or operations which may affect the discharge of significant quantities of pollutants to surface waters, ground waters, municipal storm drain systems or when deemed necessary by the Engineer. The SWPPP shall be amended if the SWPPP is in violation of any condition of the Permit, or has not effectively achieved the objective of reducing pollutants in storm water discharges. Amendments shall show additional control measures or revised operations, including those in areas not shown in the initially approved SWPPP, which are required on the project to control water pollution effectively. Amendments to the SWPPP shall be submitted for review and approval by the Engineer in the same manner specified for the initially approved SWPPP. Approved amendments shall be dated and logged in the SWPPP. Upon approval of the amendment, the Contractor shall implement the additional control measures or revised operations.

The Contractor shall keep a copy of the SWPPP and approved amendments at the project site. The SWPPP shall be made available upon request of a representative of the Regional Water Quality Control Board, State Water Resources Control Board, United States Environmental Protection Agency or the local storm water management agency. Requests by the public shall be directed to the Engineer.

By June 15 of each year, the Contractor shall submit an annual certification to the Engineer stating conformance with the requirements governing the Permit. If the project is in non-compliance at any time, the Contractor shall make a written report to the Engineer within 15 days of identification of non-compliance.

SCHEDULE OF VALUES

The Contractor shall submit with the SWPPP, for approval by the Engineer, a schedule of values detailing the cost breakdown of the contract lump sum item for water pollution control. The schedule of values shall reflect the items of work, quantities, and costs for the control measures shown in the SWPPP, except for critical temporary controls and permanent control measures which are shown on the project plans and for which there is a contract item of work. Adjustments in the items of work and quantities listed in the schedule of values shall be made when required to address approved amendments to the SWPPP.

The sum of the amounts for the units of work listed in the schedule of values shall be equal to the contract lump sum price for water pollution control.

If approved in writing by the Engineer, the schedule of values will be used to determine progress payments for water pollution control during the progress of the work. The schedule of values will be used as the basis for calculating any adjustment in compensation for the contract item for water pollution control due to changes in the work ordered by the Engineer.

SWPPP IMPLEMENTATION

Upon approval of the SWPPP, the Contractor shall be responsible throughout the duration of the project for installing, constructing, inspecting, and maintaining the control measures included in the SWPPP and any amendments thereto and for removing and disposing of temporary control measures. Unless otherwise directed by the Engineer or specified in these special provisions, the Contractor's responsibility for SWPPP implementation shall continue throughout any temporary suspension of work ordered in conformance with the provisions in Section 8-1.05, "Temporary Suspension of Work," of the Standard Specifications. Requirements for installation, construction, inspection, maintenance, removal, and disposal of control measures are specified in the Handbook and these special provisions.

Soil stabilization practices and sediment control measures, including minimum requirements, shall be provided throughout the winter season, defined as between November 1 and March 30.

Implementation of soil stabilization practices and sediment control measures for soil-disturbed areas on the project site shall be completed, except as provided for below, not later than 20 days prior to the beginning of the winter season or upon start of applicable construction activities for projects which begin either during or within 20 days of the winter season.

Throughout the winter season, the active, soil-disturbed area of the project site shall be not more than 4 hectares. The Engineer may approve, on a case-by-case basis, expansions of the active, soil-disturbed area limit. The Contractor shall demonstrate the ability and preparedness to fully deploy soil stabilization practices and sediment control measures to protect soil-disturbed areas on the project site before the onset of precipitation. A quantity of soil stabilization and sediment control materials shall be maintained on site equal to 125 percent of that sufficient to protect unprotected, soil-disturbed areas on the project site. A detailed plan for the mobilization of sufficient labor and equipment shall be maintained to fully deploy control measures required to protect unprotected, soil-disturbed areas on the project site prior to the onset of precipitation. A current inventory of control measure materials and the detailed mobilization plan shall be included as part of the SWPPP.

Throughout the winter season, soil-disturbed areas of the project site shall be considered to be nonactive whenever soil disturbing activities are expected to be discontinued for a period of 20 or more days and the areas are fully protected. Areas that will become nonactive either during the winter season or within 20 days thereof shall be fully protected with soil stabilization practices and sediment control measures within 10 days of the discontinuance of soil disturbing activities or prior to the onset of precipitation, whichever is first to occur.

Throughout the winter season, active soil-disturbed areas of the project site shall be fully protected at the end of each day with soil stabilization practices and sediment control measures unless fair weather is predicted through the following work day. The weather forecast shall be monitored by the Contractor on a daily basis. The National Weather Service forecast shall be used. An alternative weather forecast proposed by the Contractor may be used if approved by the Engineer. If precipitation is predicted prior to the end of the following work day, construction scheduling shall be modified, as required, and functioning control measures shall be deployed prior to the onset of the precipitation.

The Contractor shall implement, year-round and throughout the duration of the project, control measures included in the SWPPP for sediment tracking, wind erosion, non-storm water management and waste management and disposal.

The Engineer may order the suspension of construction operations which create water pollution if the Contractor fails to conform to the provisions of this section "Water Pollution Control" as determined by the Engineer.

MAINTENANCE

To ensure the proper implementation and functioning of control measures, the Contractor shall regularly inspect and maintain the construction site for the control measures identified in the SWPPP. The Contractor shall identify corrective actions and time needed to address any deficient measures or reinstate any measures that have been discontinued.

The construction site inspection checklist provided in the Handbook shall be used to ensure that the necessary measures are being properly implemented, and to ensure that the control measures are functioning adequately. One copy of each site inspection record shall be submitted to the Engineer.

During the winter season, inspections of the construction site shall be conducted by the Contractor to identify deficient measures, as follows:

- A. Prior to a forecast storm;
- B. After any precipitation which causes runoff capable of carrying sediment from the construction site;
- C. At 24 hour intervals during extended precipitation events; and
- D. Routinely, at a minimum of once every 2 weeks.

If the Contractor or the Engineer identifies a deficiency in the deployment or functioning of an identified control measure, the deficiency shall be corrected immediately. The deficiency may be corrected at a later date and time if requested by the Contractor and approved by the Engineer in writing, but not later than the onset of subsequent precipitation. The correction of deficiencies shall be at no additional cost to the State.

WATER POLLUTION CONTROL TRAINING

The Contractor's management and supervisory personnel along with workers involved with the placement and maintenance of storm water pollution prevention "Best Management Practices" shall be trained on general storm water pollution control requirements consistent with the "Caltrans Storm Water Quality Handbook, Construction Contractor's Guide and Specifications". The training is to be provided by the Contractor. The amount of training provided should be commensurate with the job performed by the employee.

Full compensation for water pollution control training shall be considered as included in the contract lump sum price paid for prepare storm water pollution prevention plan, and no additional compensation will be allowed therefor.

PAYMENT

The contract lump sum price paid for prepare storm water pollution prevention plan shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals for doing all the work involved in developing, preparing, obtaining approval of, revising, and amending the SWPPP, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Attention is directed to Section 9-1.06, "Partial Payments," and Section 9-1.07, "Payment After Acceptance," of the Standard Specifications. Payments for prepare storm water pollution prevention plan will be made as follows:

- A. After the SWPPP has been approved by the Engineer, 75 percent of the contract item price for prepare storm water pollution prevention plan will be included in the monthly partial payment estimate; and
- B. After acceptance of the contract pursuant to Section 7-1.17, "Acceptance of Contract," payment for the remaining 25 percent of the contract item price for prepare storm water pollution prevention plan will be made in conformance with the provisions in Section 9-1.07.

The contract lump sum price paid for water pollution control shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in installing, constructing, maintaining, removing, and disposing of control measures, except those shown on the plans and for which there is a contract item of work, and excluding developing, preparing, obtaining approval of, revising, and amending the SWPPP, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Changes in control measures required by an approved amendment to the SWPPP, except changes to those control measures shown on the plans and for which there is a contract item of work, will be considered extra work as provided in Section 4-1.03D of the Standard Specifications and the following:

- A. If the control measure is listed in the approved SWPPP schedule of values, an adjustment in compensation for the contract item for water pollution control will be made by applying the increase or decrease in quantities to the approved schedule of values. No adjustment of compensation will be made to the unit price listed for items in the schedule of values due to any increase or decrease in the quantities, regardless of the reason for the increase or decrease. The provisions in Section 4-1.03B, "Increased or Decreased Quantities," of the Standard Specifications shall not apply to items listed in the schedule of values.
- B. If the control measure is not listed in the approved SWPPP schedule of values, payment will be made by force account.

Those control measures which are shown on the plans and for which there is a contract item of work will be measured and paid for as that contract item of work.

The Engineer will retain an amount equal to 25 percent of the estimated value of the contract work performed during estimate periods in which the Contractor fails to conform to the provisions of this section "Water Pollution Control" as determined by the Engineer.

Retentions for failure to conform to the provisions in this section "Water Pollution Control" shall be in addition to the other retentions provided for in the contract. The amounts retained for failure of the Contractor to conform to the provisions in this section will be released for payment on the next monthly estimate for partial payment following the date that an approved SWPPP has been implemented and maintained, and water pollution is adequately controlled, as determined by the Engineer.

10-1.03 TEMPORARY EROSION CONTROL

Temporary erosion control shall conform to the provisions for erosion control in Section 20-3, "Erosion Control," of the Standard Specifications and these special provisions.

Attention is directed to "Water Pollution Control" of these special provisions.

Temporary erosion control work shall consist of applying erosion control materials to embankment slopes, excavation slopes and other areas designated on the plans. Temporary erosion control work shall be completed in the designated areas after fiber optic work and maintenance vehicle pullout construction is complete and an area becomes inactive as defined in "Water Pollution Control" of these special provisions.

MATERIALS

Materials shall conform to the provisions in Section 20-2, "Materials," of the Standard Specifications and the following:

Straw

Straw shall be derived from rice. Straw shall be fumigated.

Stabilizing Emulsion

Stabilizing emulsion shall conform to the provisions in Section 20-2.11, "Stabilizing Emulsion," of the Standard Specifications and these special provisions.

The requirement of an effective life of at least one year for stabilizing emulsion shall not apply.

Stabilizing emulsion shall be in a dry powder form, may be reemulsifiable, and shall be a processed organic adhesive.

APPLICATION

Temporary erosion control materials shall be applied in 2 separate applications in the following sequence:

- A. Straw shall be applied at the rate of 2 tonnes per hectare based on slope measurements. Incorporation of straw will not be required.
- B. The following mixture in the proportions indicated shall be applied with hydro-seeding equipment:

Material	Kilograms Per Hectare (Slope Measurement)
Stabilizing Emulsion (solids)	150

- C. The ratio of total water to total stabilizing emulsion in the mixture shall be as recommended by the manufacturer.
- D. Once straw work is started in an area, the remaining applications shall be completed in that area on the same working day.

MEASUREMENT AND PAYMENT

Temporary erosion control will be measured and paid for by the square meter in the same manner specified for erosion control in Sections 20-3.06 and 20-3.07 of the Standard Specifications.

Temporary erosion control placed at locations other than as shown on the project plans or directed by the Engineer, in conformance with the Contractor's Storm Water Pollution Prevention Plan, will not be measured and will be paid for as specified in "Water Pollution Control" of these special provisions.

No adjustment of compensation will be made for any increase or decrease in the quantities of temporary erosion control required, regardless of the reason for the increase or decrease. The provisions in Section 4-1.03B, "Increased or Decreased Quantities," of the Standard Specifications shall not apply to temporary erosion control.

10-1.04 TEMPORARY FIBER ROLL

Temporary fiber rolls shall conform to the details shown on the plans, the provisions in Section 20-3, "Erosion Control," of the Standard Specifications and these special provisions.

Temporary fiber rolls shall be furnished, installed, maintained, and removed at the locations shown on the plans.

Attention is directed to "Water Pollution Control" of these special provisions.

MATERIALS

Materials for temporary fiber rolls shall conform to the provisions in Section 20-2, "Materials," of the Standard Specifications.

Temporary fiber roll shall consist of a field rolled erosion control blanket rolled into tubes with a minimum diameter of 200 mm. The rolls shall be bound with a jute-type twine at the ends and at a minimum of every 1.8 m along the length of the roll. The roll shall weigh not less than 1.9 kg per linear meter.

Stakes shall be fir or pine and shall have a cross-sectional area of at least 360 mm² and a minimum length of 600 mm.

INSTALLATION

Temporary fiber roll shall be installed as shown on the plans and in conformance with Detail Sheet 1 in Appendix C, CD43(2) in the Construction Contractors Guide and Specifications of the Caltrans Storm Water Quality Handbooks and the manufacturer's recommendations.

Fiber rolls shall be placed on contours with a vertical separation of 3.0 m.

Temporary fiber rolls shall be maintained to disperse concentrated water runoff and to reduce runoff velocities. When no longer required for the intended purpose, as determined by the Engineer, temporary fiber rolls shall be removed from the site of the work.

MEASUREMENT AND PAYMENT

The quantity of temporary fiber roll will be measured by the meter as determined from one end to the other end along the surface of the roll.

The contract price paid per meter for temporary fiber roll shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in installing temporary fiber rolls, complete in place, including maintenance and removal of materials, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Temporary fiber roll placed at locations other than as shown on the plans or where directed by the Engineer, in conformance with the Contractor's Storm Water Pollution Prevention Plan, will not be measured and will be paid for as specified in "Water Pollution Control" of these special provisions.

No adjustment of compensation will be made for any increase or decrease in the quantities of temporary fiber roll required, regardless of the reason for the increase or decrease. The provisions in Section 4-1.03B, "Increased or Decreased Quantities," of the Standard Specifications shall not apply to temporary fiber roll.

10-1.05 TEMPORARY SILT FENCE

Temporary silt fence shall conform to the details shown on the plans and these special provisions.

Temporary silt fence shall be furnished, installed, maintained, and removed at the locations shown on the plans.

Preparation shall conform to the provisions in Section 20-3.02, "Preparation," of the Standard Specifications.

Attention is directed to "Water Pollution Control" of these special provisions.

MATERIALS

Materials for temporary silt fence shall conform to the provisions in Section 20-2, "Materials," of the Standard Specifications.

Temporary silt fence shall be a prefabricated silt fence with a minimum woven polypropylene fabric width of 900 mm and a minimum tensile strength of 0.44-kN, conforming to the requirements of ASTM Designation: D 4632.

INSTALLATION

Temporary silt fence shall be installed as shown on the plans and in conformance with Detail Sheets 1 and 2 in Appendix C, CD36(2) in the Construction Contractors Guide and Specifications of the Caltrans Storm Water Quality Handbooks.

When joints are necessary, the temporary silt fence shall overlap a minimum of 150 mm with both posts tied together.

Temporary silt fences shall be maintained to provide for adequate sediment holding capacity. Sediment deposits shall be removed when the sediment deposit reaches approximately one-third of the fence height. Removed sediment shall be deposited within the project in such a way that the sediment is not subject to erosion by wind or water, or as directed by the Engineer.

When no longer required for the intended purpose, as determined by the Engineer, temporary silt fence shall be removed from the site of the work.

Holes, depressions or any other ground disturbance caused by the removal of the temporary silt fence shall be backfilled and repaired in conformance with the provisions in the second paragraph of Section 15-1.02, "Preservation of Property," of the Standard Specifications.

MEASUREMENT AND PAYMENT

The quantity of temporary silt fence will be measured by the meter as determined from actual measurements, the measurements to be made parallel with the ground slope along the line of the completed temporary silt fence, deducting the widths of openings.

The contract price paid per meter for temporary silt fence shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in installing temporary silt fence, complete in place, including trench excavation and backfill, and maintenance and removal of temporary silt fence, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Temporary silt fence placed at location other than as shown on the project plans or directed by the Engineer, in conformance with the Contractor's Storm Water Pollution Prevention Plan, will not be measured and will be paid for as specified in "Water Pollution Control" of these special provisions.

No adjustment of compensation will be made for any increase or decrease in the quantities of temporary silt fence required, regardless of the reason for the increase or decrease. The provisions in Section 4-1.03B, "Increased or Decreased Quantities," of the Standard Specifications shall not apply to temporary silt fence.

10-1.06 PRESERVATION OF PROPERTY

Attention is directed to Section 7-1.11, "Preservation of Property," of the Standard Specifications and these special provisions.

Existing trees, shrubs and other plants, that are not to be removed as shown on the plans or specified in these special provisions, and are injured or damaged by reason of the Contractor's operations, shall be replaced by the Contractor. The minimum size of tree replacement shall be 600 mm box and the minimum size of shrub replacement shall be No. 15 container. Replacement ground cover plants shall be from flats and shall be planted 300 mm on center. Replacement of Carpobrotus ground cover plants shall be from cuttings and shall be planted 300 mm on center. Replacement planting shall conform to the requirements in Section 20-4.07, "Replacement," of the Standard Specifications. The Contractor shall water replacement plants in conformance with the provisions in Section 20-4.06, "Watering," of the Standard Specifications.

Damaged or injured plants shall be removed and disposed of outside the highway right of way in conformance with the provisions in Section 7-1.13 of the Standard Specifications. At the option of the Contractor, removed trees and shrubs may be reduced to chips. The chipped material shall be spread within the highway right of way at locations designated by the Engineer.

Replacement planting of injured or damaged trees, shrubs, and other plants shall be completed prior to the start of the plant establishment period. Replacement planting shall conform to the provisions in Section 20-4.05, "Planting," of the Standard Specifications.

10-1.07 TEMPORARY GRAVEL BAG

Temporary gravel bag shall conform to the details shown on the plans and these special provisions.

Temporary gravel bag shall be furnished, installed, maintained and removed at the locations shown on the plans.

Preparation shall conform to the provisions in Section 20-3.02, "Preparation," of the Standard Specifications.

Attention is directed to "Water Pollution Control" of these special provisions.

MATERIALS

Materials shall conform to the provisions in Section 20-2, "Materials," of the Standard Specifications.

Gravel bag fabric shall be woven polypropylene, polyethylene or Polyamide with a minimum unit weight of 135 g/m². The fabric shall have a mullen burst strength of at least 2067 kPa, conforming to the requirements in ASTM Designation: D 3786 and an ultraviolet (UV) stability exceeding 70 percent.

Gravel shall have a length of 600 mm to 800 mm, width of 400 mm to 450 mm, thickness of 150 mm to 200 mm, and mass of 40 kg to 55 kg.

Gravel fill material shall be non-cohesive, gravel, free from deleterious material.

INSTALLATION

Temporary gravel bag barriers consisting of gravel bags placed in multiple layers shall be installed as shown on the plans and in conformance with Detail Sheet 1 in Appendix C, CD38(2) in the Construction Contractors Guide and Specifications of the Caltrans Storm Water Quality Handbooks.

Temporary gravel bag barriers shall be maintained to provide for adequate sediment holding capacity. Sediment deposits shall be removed when the deposit reaches one-third of the temporary gravel bag barrier height. Removed sediment shall be deposited within the project in such a way that the sediment is not subject to erosion by wind or water, or as directed by the Engineer.

When no longer required for the intended purpose, as determined by the Engineer, temporary gravel bag barriers shall be removed from the site of the work.

Holes, depressions or any other ground disturbance caused by the removal of the temporary gravel bag barriers shall be backfilled and repaired in conformance with the provisions in the second paragraph of Section 15-1.02, "Preservation of Property," of the Standard Specifications.

MEASUREMENT AND PAYMENT

Temporary gravel bag barrier will be measured by the unit as determined from actual count in place.

The contract unit price paid for temporary gravel bag shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in installing temporary gravel bag barriers complete in place, including maintenance and removal of materials, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Temporary gravel bag barriers placed at locations other than as shown on the project plans or directed by the Engineer, in accordance with the Contractor's Storm Water Pollution Prevention, will not be measured and will be paid for as specified in "Water Pollution Control" of these special provisions.

No adjustment of compensation will be made for any increase or decrease in the quantities of temporary gravel bag required, regardless of the reason for the increase or decrease. The provisions in Section 4-1.03B, "Increased or Decreased Quantities," of the Standard Specifications shall not apply to temporary gravel bag.

10-1.08 RELIEF FROM MAINTENANCE AND RESPONSIBILITY

The Contractor may be relieved of the duty of maintenance and protection for those items not directly connected with plant establishment work, except highway planting and irrigation systems in conformance with the provisions in Section 7-1.15, "Relief From Maintenance and Responsibility," of the Standard Specifications.

10-1.09 COOPERATION

Attention is directed to Section 7-1.14, "Cooperation," and Section 8-1.10, "Utility and Non-Highway Facilities," of the Standard Specifications and these special provisions.

It is anticipated that work by another contractor (Contract No.11-228701) to perform pavement rehabilitation in San Diego on Route 5 from Routes 5/15 separation to National Avenue Overcrossing (KP R20.3 to KP R21.7), and on Route 15 from Main Street to 0.1 km north of Ocean View Blvd. Overcrossing (KP 0.6 to KP R1.1), and (Contract No. 11-0219U4) restoration and rehabilitation seismic retrofit-toll bridge on Route 75 from the end of toll bridge to Route 5 and on the Route 5 form 0.16 km north of the Sampson Street Overcrossing to 0.16 km north of the Crosby Street Undercrossing bridge, may be in progress adjacent to or within the limits of this project during progress of the work on this contract.

Consecutive on-ramp or off-ramps in the same direction of travel shall not be closed simultaneously unless otherwise provided in these special provisions or permitted by the Engineer.

10-1.10 PROGRESS SCHEDULE

Progress schedules are required for this contract and shall be submitted in conformance with the provisions in Section 8-1.04, "Progress Schedule," of the Standard Specifications.

10-1.11 OBSTRUCTIONS

Attention is directed to Section 8-1.10, "Utility and Non-Highway Facilities," and Section 15, "Existing Highway Facilities," of the Standard Specifications and these special provisions.

Attention is directed to the existence of certain underground facilities that may require special precautions be taken by the Contractor to protect the health, safety and welfare of workers and of the public. Facilities requiring special precautions include, but are not limited to: conductors of petroleum products, oxygen, chlorine, and toxic or flammable gases; natural gas in pipelines greater than 150 mm in diameter or pipelines operating at pressures greater than 415 kPa (gage); underground electric supply system conductors or cables, with potential to ground of more than 300 V, either directly buried or in a duct or conduit which do not have concentric grounded or other effectively grounded metal shields or sheaths.

The Contractor shall notify the Engineer and the appropriate regional notification center for operators of subsurface installations at least 2 working days, but not more than 14 calendar days, prior to performing any excavation including excavation for construction area signs. Regional notification centers include but are not limited to the following:

Notification Center	Telephone Number
Underground Service Alert-Northern California (USA)	1-800-642-2444 1-800-227-2600
Underground Service Alert-Southern California (USA)	1-800-422-4133 1-800-227-2600

The following utility facilities are shown on the plans and require special handling. This does not relieve the Contractor of his responsibility for other utility facilities on the project.

Utility	Location	Note
250 mm Gas Main	On Wabash Blvd	A & B
75 mm Gas Main	Crossing SD-94 on 25 th Street	B
250 mm Fuel Line	Crossing SD 94 on 28 th Street	A & B
200 mm Gas Main	Crossing SD 94 on 28 th Street	A & B
100 mm Gas Main	On 30 th Street South	B
150 mm Gas Main	Crossing SD-94 at station 56+22	A & B
50 mm Gas Main	On Home Avenue & Ash Street	B
50 mm Gas Main	On Federal Blvd	B
400 mm Gas Main	Crossing SD-5 on 32 nd Street	A & B
200 mm Gas Main	Crossing SD-5 on 32 nd Street	A & B
400 mm Gas Main	On Birch Street	A & B
200 mm Gas Main	On Birch Street	A & B
38 mm Gas	On Dalbergia Street	B
150 mm Gas Main	On Main Street	A & B
150 mm Gas Main	On Newton Avenue	A & B
400 mm Gas Main	On Boston Avenue	A & B
200 mm Gas Main	On Boston Avenue	A & B
12000 Volt Electricity	On Coronado Bridge	A & B
38 mm Gas	On Bay Front Street	B
50 mm Gas Main	By Trolley Rail	B
150 mm Oil Pipe	On Harbor Drive	A & B
400 mm Gas Main	On Main Street	A & B
25 mm Gas	On Main Street	B
75 mm Gas Main	On Newton Avenue	B
75 mm Gas in 300 mm Conduit	On National Avenue	A & B
50 mm Gas	On 17th Street	B
50 mm Gas	On 19th Street	B
50 mm Gas	On 20th Street	B
50 mm Gas	On 21st Street	B
50 mm Gas	On 22nd Street	B
50 mm Gas	On 23rd Street	B
50 mm Gas	On 24th Street	B
50 mm Gas	On F Street	B
50 mm Gas	On G Street	B

50 mm Gas	On Gledale Avenue	B
50 mm Gas	On 26th Street	B
38 mm Gas	On 27th Street	B
38 mm Gas	On Cerro Dordo Avenue	B
50 mm Gas	On Treat Street	B
50 mm Gas	On 30th Street North	B
50 mm Gas	Crossing SD 94 On Home Avenue	B

- (A) -- A representative of the utility owner shall be present whenever excavation is performed within 1.2 m of the utility. The utility company must be notified by the Contractor 2 days before excavation.
- (B) -- No excavation shall be performed within 1.2 m of the utility until the owner, or his representative has located the facility by pot holing, probing, or other means that will locate and identify the facility both horizontally and vertically. The utility company will be allowed 20 working days to perform this work.

Excavation in areas requiring regional notification center investigation shall not be commenced until all utilities in these areas have been located and identified.

Power equipment may be used for excavating construction area sign postholes if it is determined that there are no utility facilities within 1.2 m of the proposed postholes.

Hand excavation shall be used when it is determined that utility facilities are within 1.2 meter of any proposed excavation.

10-1.12 MOBILIZATION

Mobilization shall conform to the provisions in Section 11, "Mobilization," of the Standard Specifications.

10-1.13 CONSTRUCTION AREA SIGNS

Construction area signs shall be furnished, installed, maintained, and removed when no longer required in conformance with the provisions in Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications and these special provisions.

Attention is directed to the provisions in "Approved Traffic Products" and "Obstructions" of these special provisions. Type II retroreflective sheeting shall not be used on construction area sign panels.

Attention is directed to "Construction Project Information Signs" of these special provisions regarding the number and type of construction project information signs to be furnished, erected, maintained, and removed and disposed of.

Sign substrates for stationary mounted construction area signs may be fabricated from fiberglass reinforced plastic as specified under "Approved Traffic Products" of these special provisions.

10-1.14 MAINTAINING TRAFFIC

Attention is directed to Sections 7-1.08, "Public Convenience," 7-1.09, "Public Safety," and 12, "Construction Area Traffic Control Devices," of the Standard Specifications and to the provisions in "Public Safety" of these special provisions and these special provisions. Nothing in these special provisions shall be construed as relieving the Contractor from the responsibilities specified in Section 7-1.09.

Attention is directed to "Traffic Plastic Drums," elsewhere in these special provisions regarding the use of plastic drums in place of portable delineators, cones or Type I or II barricades.

Lane closures shall conform to the provisions in section "Traffic Control System for Lane Closure" of these special provisions.

Personal vehicles of the Contractor's employees shall not be parked on the traveled way or shoulders including any section closed to public traffic.

Whenever vehicles or equipment are parked on the shoulder within 1.8 m of a traffic lane, the shoulder area shall be closed as shown on the plans.

Lanes shall be closed only during the hours shown on the charts included in this section "Maintaining Traffic." Except work required under Sections 7-1.08 and 7-1.09, work that interferes with public traffic shall be performed only during the hours shown for lane closures.

The full width of the traveled way shall be open for use by public traffic when construction operations are not actively in progress.

Designated legal holidays are: January 1st, the third Monday in February, the last Monday in May, July 4th, the first Monday in September, November 11th, Thanksgiving Day, and December 25th. When a designated legal holiday falls on a Sunday, the following Monday shall be a designated legal holiday. When November 11th falls on a Saturday, the preceding Friday shall be a designated legal holiday.

Minor deviations from the requirements of this section concerning hours of work which do not significantly change the cost of the work may be permitted upon the written request of the Contractor, if in the opinion of the Engineer, public traffic will be better served and the work expedited. These deviations shall not be adopted by the Contractor until the Engineer has approved the deviations in writing. All other modifications will be made by contract change order.

Chart No. 1 Multilane Lane Requirements																							
Direction: Northbound SD-5												Location: 0.46 km N. of 8 th St. UC to 0.34 km N. of Vesta St. UC											
FROM HOUR TO HOUR																							
Mondays through Thursdays	1	1	1	1	1																1	1	1
Fridays	1	1	1	1	1																		
Saturdays				1	1	1	1	1	1	1	1	1	1	1	1	1	1						
Sundays				1	1	1	1	1	1	1	1	1	1	1	1	1	1				1	1	1
Day before designated legal holiday	1	1	1	1	1																		
Designated legal holidays																							
Legend:																							
<div>1</div> One auxiliary lane may be closed.																							
<div></div> No lane closure allowed.																							
REMARKS:																							
KP: R18.37/R19.69																							

Chart No. 2 Multilane Lane Requirements																							
Direction: Southbound SD-5												Location: Vesta St. UC to Samson St. OC											
FROM HOUR TO HOUR																							
Mondays through Thursdays	3	3	3	3	3				3	3	3	3	3	3	3						3	3	3
Fridays	3	3	3	3	3				3	3	3	3											
Saturdays				3	3	3	3	3	3	3	3	3											
Sundays				3	3	3	3	3	3	3	3	3	3	3							3	3	3
Day before designated legal holiday	3	3	3	3	3				3	3	3	3											
Designated legal holidays																							
Legend:																							
<div>3</div> Three adjacent lanes open in direction of travel.																							
<div></div> No lane closure allowed.																							
REMARKS:																							
KP: R19.35/R22.15																							

Chart No. 3 Multilane Lane Requirements																																								
DIRECTION: Northbound SD-75												Location: Glorietta Blvd. To 0.23 km N. of Toll Gate																												
												a.m.												p.m.																
FROM HOUR TO HOUR												12	1	2	3	4	5	6	7	8	9	10	11	12	12	1	2	3	4	5	6	7	8	9	10	11	12			
Mondays through Thursdays												2	2	2	2	2					2	2	2	2	2	2	2								2	2	2			
Fridays												2	2	2	2	2					2	2	2	2	2	2	2													
Saturdays																2	2	2	2	2	2	2	2	2	2	2	2	2	2											
Sundays																2	2	2	2	2	2	2	2	2	2	2	2	2	2							2	2	2		
Day before designated legal holiday												2	2	2	2	2					2	2	2	2	2	2	2	2												
Designated legal holidays																																								
Legend: <div style="display: flex; align-items: center; margin-bottom: 5px;"> <div style="border: 1px solid black; width: 20px; height: 15px; display: flex; align-items: center; justify-content: center; margin-right: 5px;">2</div> Two adjacent lanes open in direction of travel. </div> <div style="display: flex; align-items: center; margin-bottom: 5px;"> <div style="border: 1px solid black; width: 20px; height: 15px; display: flex; align-items: center; justify-content: center; margin-right: 5px;"></div> No lane closure allowed. </div>																																								
REMARKS: KP: 32.41/ 32.84																																								

Chart No. 4 Multilane Lane Requirements																																							
DIRECTION: Northbound SD-15												Location: 1.22 km N. of Oceanview Blvd. OC to 0.15 km N. of JCT 15/94 Sep. (R)																											
												a.m.												p.m.															
FROM HOUR TO HOUR												12	1	2	3	4	5	6	7	8	9	10	11	12	12	1	2	3	4	5	6	7	8	9	10	11	12		
Mondays through Thursdays												1	1	1	1	1	1	1																			1	1	
Fridays												1	1	1	1	1	1	1																					
Saturdays																1	1	1	1	1	1	1	1	1															
Sundays																1	1	1	1	1	1	1	1	1	1											1	1		
Day before designated legal holiday												1	1	1	1	1	1	1																					
Designated legal holidays																																							
Legend: <div style="display: flex; align-items: center; margin-bottom: 5px;"> <div style="border: 1px solid black; width: 20px; height: 15px; display: flex; align-items: center; justify-content: center; margin-right: 5px;">1</div> One lane open in direction of travel. </div> <div style="display: flex; align-items: center; margin-bottom: 5px;"> <div style="border: 1px solid black; width: 20px; height: 15px; display: flex; align-items: center; justify-content: center; margin-right: 5px;"></div> No lane closure allowed. </div>																																							
REMARKS: KP: R2.16/ 3.68																																							

Chart No. 5 Multilane Lane Requirements																										
DIRECTION: Northbound SD-15												Location: 0.14 km S. of JCT RTE 15/ 94 Sep. (R) to 0.1 km N. of JCT RTE 15/ 94 Sep.(R)														
FROM HOUR TO HOUR		a.m.											p.m.													
		12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Mondays through Thursdays											S	S	S	S	S	S	S									
Fridays											S	S	S	S	S	S										
Saturdays										S	S	S	S	S	S	S	S	S								
Sundays										S	S	S	S	S	S	S	S	S								
Day before designated legal holiday											S	S	S	S	S	S										
Designated legal holidays																										
Legend:																										
<div>S</div>		Shoulder may be closed																								
<div></div>		No lane closure allowed.																								
REMARKS:																										
KP: 3.39/ 3.64																										

Chart No. 6 Multilane Lane Requirements																										
DIRECTION: Southbound SD-15												Location: 0.15 km S. of JCT RTE 15/ 94 Sep (R) to 0.52 km S. of JCT RTE 15/ 805														
FROM HOUR TO HOUR		a.m.											p.m.													
		12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Mondays through Thursdays		1	1	1	1	1																	1	1	1	1
Fridays		1	1	1	1	1																				
Saturdays					1	1	1	1	1	1	1	1	1	1	1											
Sundays					1	1	1	1	1	1	1	1	1	1	1	1	1	1					1	1	1	1
Day before designated legal holiday		1	1	1	1	1																				
Designated legal holidays																										
Legend:																										
1		One lane open in direction of travel																								
		No lane closure allowed.																								
REMARKS:																										
KP: 3.38/ R4.89																										

Chart No. 7 Multilane Lane Requirements																										
DIRECTION: Southbound SD-15													Location: 0.1 km S. of JCT 15/ 94 Sep. (R) to JCT RTE 15/ 94 Sep. (L)													
FROM HOUR TO HOUR			a.m.											p.m.												
			12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11
Mondays through Thursdays											S	S	S	S	S	S	S	S								
Fridays											S	S	S	S	S	S	S	S								
Saturdays										S	S	S	S	S	S	S	S	S	S							
Sundays										S	S	S	S	S	S	S	S	S	S							
Day before designated legal holiday											S	S	S	S	S	S	S	S								
Designated legal holidays																										
Legend:																										
<div>S</div>			Shoulder may be closed																							
<div></div>			No lane closure allowed.																							
REMARKS:																										
KP: 3.44/ 3.63																										

Chart No. 8 Multilane Lane Requirements																											
Direction: Westbound SD-94													Location: JCT RTE 94/ 5 to JCT RTE 94/ 805														
FROM HOUR TO HOUR			a.m.											p.m.													
			12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Mondays through Thursdays			1	1	1	1	1						3	3	3	3	3	3						2	2	1	1
Fridays			1	1	1	1	1						3	3	3	3	3	3									
Saturdays						1	1	1	2	2	3	3	3	3	3	3	3	3	3								
Sundays						1	1	1	2	2	2	2	3	3	3	3	3	3	3					2	2	1	1
Day before designated legal holiday			1	1	1	1	1						3	3	3	3	3	3									
Designated legal holidays																											
Legend:																											
1			One lane open in direction of travel																								
2			Two adjacent lanes open in direction of travel																								
3			Three adjacent lanes open in direction of travel																								
			No lane closure allowed																								
REMARKS:																											
KP: 2.27/ 5.10																											

Chart No. 9 Multilane Lane Requirements																										
Direction: Eastbound SD-94												Location: JCT RTE 94/ 5 to JCT RTE 94/ 805														
FROM HOUR TO HOUR			a.m.											p.m.												
			12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11
Mondays through Thursdays			1	1	1	1	1	1			2	2	2	3	3	3							2	2	2	1
Fridays			1	1	1	1	1	1			2	2	2	3	3	3										
Saturdays						1	1	1	1	2	2	2	2	2	3	3	3	3	3							
Sundays						1	1	1	1	1	1	2	2	2	2	2	3	3	3				2	2	2	1
Day before designated legal holiday			1	1	1	1	1	1			2	2	2	3	3	3										
Designated legal holidays																										
Legend:																										
1			One lane open in direction of travel																							
2			Two adjacent lanes open in direction of travel																							
3			Three adjacent lanes open in direction of travel																							
			No lane closure allowed																							
REMARKS:																										
KP: 2.27/ 5.10																										

Chart No. 10 Ramp Lane Requirements																														
Direction: Northbound SD-5						Location: NB Off-ramp to NB RTE 15												KP: 19.785												
						a.m.												p.m.												
FROM HOUR TO HOUR						12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Mondays through Thursdays						1	1	1	1	1																	1	1	1	
Fridays						1	1	1	1	1																				
Saturdays									1	1	1	1	1	1	1	1	1	1	1	1	1									
Sundays									1	1	1	1	1	1	1	1	1	1	1	1	1					1	1	1		
Day before designated legal holiday						1	1	1	1	1																				
Designated legal holidays																														
Legend:																														
1		One adjacent lane open in direction of travel																												
		No work that interferes with public traffic will be allowed																												
REMARKS:																														
NOTE: This chart shall be used in conjunction with Chart #1.																														

Chart No.11 Ramp Lane Requirements																															
Direction: Northbound SD-5						Location: SB Off-ramp to Main St. SB Off-ramp to NB RTE 15												KP: R19.912 R20.419													
						a.m.												p.m.													
FROM HOUR TO HOUR						12	1	2	3	4	5	6	7	8	9	10	11	12	12	1	2	3	4	5	6	7	8	9	10	11	12
Mondays through Thursdays						R	R	R	R	R																			R	R	R
Fridays						R	R	R	R	R																					
Saturdays										R	R	R	R																		
Sundays										R	R	R	R	R	R													R	R	R	
Day before designated legal holiday						R	R	R	R	R																					
Designated legal holidays																															
Legend: <div style="display: flex; align-items: center; margin-bottom: 5px;"> <div style="border: 1px solid black; width: 20px; height: 10px; display: inline-block; margin-right: 5px;"></div> R Ramp may be closed </div> <div style="display: flex; align-items: center; margin-bottom: 5px;"> <div style="border: 1px solid black; width: 20px; height: 10px; display: inline-block; margin-right: 5px;"></div> No work that interferes with public traffic will be allowed </div>																															
REMARKS: Detour SB RTE 5 to NB RTE 15 traffic via southerly on RTE 5 to SB RTE 5 Off-ramp to Main St. thence southerly on Main St. to Division St. thence easterly on Division St. to Osborn St. thence northerly on Osborn St. to NB RTE 5 On-ramp from Osborn St. thence northerly on RTE 5 to NB RTE 5 Off-ramp to NB RTE 15.																															

Chart No.12 Ramp Lane Requirements																															
Direction: Southbound SD-5						Location: SB On-ramp from Boston Ave./ 29 th St.												KP: R21.234													
						a.m.												p.m.													
FROM HOUR TO HOUR						12	1	2	3	4	5	6	7	8	9	10	11	12	12	2	3	4	5	6	7	8	9	10	11	12	
Mondays through Thursdays						R	R	R	R	R																			R	R	R
Fridays						R	R	R	R	R																					
Saturdays										R	R	R	R	R	R	R															
Sundays										R	R	R	R	R	R	R	R	R										R	R	R	
Day before designated legal holiday						R	R	R	R	R																					
Designated legal holidays																															
Legend: <div style="display: flex; align-items: center; margin-bottom: 5px;"> <div style="border: 1px solid black; width: 20px; height: 10px; display: inline-block; margin-right: 5px;"></div> R Ramp may be closed </div> <div style="display: flex; align-items: center; margin-bottom: 5px;"> <div style="border: 1px solid black; width: 20px; height: 10px; display: inline-block; margin-right: 5px;"></div> No work that interferes with public traffic will be allowed </div>																															
REMARKS:																															

Chart No.13																																					
Ramp Lane Requirements																																					
DIRECTION: Northbound and Southbound "32 nd St."												LOCATION: RTE 5																									
												a.m.												p.m.													
FROM HOUR TO HOUR												12	1	2	3	4	5	6	7	8	9	10	11	12	2	3	4	5	6	7	8	9	10	11	12		
Mondays through Thursdays												X	X	X	X	X					X	X	X	X	X	X	X								X	X	X
Fridays												X	X	X	X	X					X	X	X	X	X	X	X										
Saturdays																				X	X	X	X	X	X	X	X	X									
Sundays																				X	X	X	X	X	X	X	X	X						X	X	X	
Day before designated legal holiday												X	X	X	X	X					X	X	X	X	X	X	X										
Designated legal holidays																																					

Legend:

X

One-Way traffic control permitted:

1. Close one traffic lane and stop public traffic for periods not to exceed ten minutes.
2. Provide at least one traffic lane not less than 3.60 m wide.
3. Maximum length of one-way control shall be 750 m

No work that interferes with public traffic will be allowed

REMARKS: KP: R20.730

Chart No. 14																																						
Ramp Lane Requirements																																						
Direction: Northbound SD-15												Location: NB On-ramp from Main St.												KP: 0.774														
												a.m.												p.m.														
FROM HOUR TO HOUR												12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12		
Mondays through Thursdays												R	R	R	R	R					R	R	R	R											R	R	R	
Fridays												R	R	R	R	R					R	R	R	R														
Saturdays																R	R	R	R	R	R	R	R	R	R	R	R	R	R									
Sundays																R	R	R	R	R	R	R	R	R	R	R	R	R	R						R	R	R	
Day before designated legal holiday												R	R	R	R	R					R	R	R	R														
Designated legal holidays																																						

Legend:

R

Ramp may be closed

No work that interferes with public traffic will be allowed

REMARKS:

Chart No. 15 Ramp Lane Requirements																														
Direction: Northbound SD-15					Location: NB On-ramp from Market St. NB Off-ramp to EB RTE 94 & Home Ave.											KP: 2.848 3.458														
					a.m.											p.m.														
FROM HOUR TO HOUR					12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	
Mondays through Thursdays					R	R	R	R	R	R																		R		
Fridays					R	R	R	R	R	R																				
Saturdays									R	R	R																			
Sundays									R	R	R	R															R	R		
Day before designated legal holiday					R	R	R	R	R	R																				
Designated legal holidays																														
Legend:																														
R		Ramp may be closed																												
		No work that interferes with public traffic will be allowed																												
REMARKS:																														
Detour NB RTE 15 to EB RTE 94 traffic via NB RTE 15 Off-ramp to Market St. thence westerly on Market St. to Broadway Ave. thence northerly on Broadway Ave. to 'F' St. thence westerly on 'F' Street to EB RTE 94 On-ramp from 'F' Street. NOTES: (1) Place Portable Changeable Message Sign (PCMS) on NB RTE 15 - just north of Ocean View Blvd. OC - to warn motorists of ramp closure/ detour ahead. (2) NB RTE 15 On-ramp from Market St. shall be closed at the same time.																														

Chart No. 16 Ramp Lane Requirements																													
DIRECTION: Southbound SD-15					LOCATION: SB Off-ramp to NB RTE 5												KP: 0.241												
Eastbound SD-94					EB Off-ramp to 28 th St.												3.636												
					a.m.												p.m.												
FROM HOUR TO HOUR					12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Mondays through Thursdays					R	R	R	R	R																R	R	R	R	
Fridays					R	R	R	R	R																				
Saturdays									R	R	R	R	R	R															
Sundays									R	R	R	R	R	R											R	R	R	R	
Day before designated legal holiday					R	R	R	R	R																				
Designated legal holidays																													
Legend:																													
R		Ramp may be closed																											
		No work that interferes with public traffic will be allowed																											
REMARKS:																													
Detour SB RTE 15 to NB RTE 5 traffic via southerly on RTE 15 to SB RTE 15 Off-ramp to Main St. thence westerly on Main St. to 28 th St. thence northerly on 28 th St. to NB RTE 5 On-ramp from 28 th St.																													

Chart No. 17 Ramp Lane Requirements																													
DIRECTION: Southbound SD-15					LOCATION: SB Off-ramp to SB RTE 5										KP: R0.465														
					a.m.										p.m.														
FROM HOUR TO HOUR					12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Mondays through Thursdays					R	R	R	R	R					R	R	R	R	R	R								R	R	R
Fridays					R	R	R	R	R					R	R	R	R												
Saturdays									R	R	R	R	R	R	R	R													
Sundays									R	R	R	R	R	R	R	R	R	R	R								R	R	R
Day before designated legal holiday					R	R	R	R	R					R	R	R	1												
Designated legal holidays																													
Legend:																													
<div>R</div>					Ramp may be closed																								
<div></div>					No work that interferes with public traffic will be allowed																								
REMARKS:																													

Chart No. 18 Ramp Lane Requirements																													
DIRECTION: Southbound SD-15					LOCATION: SB Off-ramp to WB RTE 94										KP: 3.815														
					a.m.										p.m.														
FROM HOUR TO HOUR					12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Mondays through Thursdays					R	R	R	R	R																			R	R
Fridays					R	R	R	R	R																				
Saturdays									R	R	R	R																	
Sundays									R	R	R	R																R	R
Day before designated legal holiday					R	R	R	R	R																				
Designated legal holidays																													
Legend:																													
<div>R</div>					Ramp may be closed																								
<div></div>					No work that interferes with public traffic will be allowed																								
REMARKS:																													
Detour SB RTE 15 to WB RTE 94 traffic via southerly on RTE 15 to SB RTE 15 Off-ramp to Market St. thence easterly on Market St. to NB RTE 15 On-ramp from Market St. thence northerly on RTE 15 to NB RTE 15 Off-ramp to WB RTE 94.																													

Chart No. 19 Ramp Lane Requirements																													
DIRECTION: Eastbound SD-94				LOCATION:.. EB On-ramp from 25 th St. EB On-ramp from 28 th St.												KP: 3.124 3.756													
				a.m.												p.m.													
FROM HOUR TO HOUR				12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	
Mondays through Thursdays				R	R	R	R	R	R																			R	R
Fridays				R	R	R	R	R	R																				
Saturdays								R	R	R	R	R	R																
Sundays								R	R	R	R	R	R														R	R	
Day before designated legal holiday				R	R	R	R	R	R																				
Designated legal holidays																													
Legend: <div style="display: flex; align-items: center; margin-bottom: 5px;"> <div style="border: 1px solid black; width: 20px; height: 15px; display: flex; align-items: center; justify-content: center; margin-right: 5px;">R</div> Ramp may be closed </div> <div style="display: flex; align-items: center; margin-bottom: 5px;"> <div style="border: 1px solid black; width: 20px; height: 15px; display: flex; align-items: center; justify-content: center; margin-right: 5px;"></div> No work that interferes with public traffic will be allowed </div>																													
REMARKS: No two consecutive on-ramps shall be closed at the same time.																													

Chart No. 20 Ramp Lane Requirements																													
DIRECTION: Westbound SD-94				LOCATION:.. WB Off-ramp to 'F' St.												KP: 2.280													
				a.m.												p.m.													
FROM HOUR TO HOUR				12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	
Mondays through Thursdays				R	R	R	R	R	R				R	R	R	R	R	R	R	R						R	R	R	R
Fridays				R	R	R	R	R	R				R	R	R	R	R	R	R	R									
Saturdays								R	R	R	R	R	R	R	R	R	R	R	R	R	R								
Sundays								R	R	R	R	R	R	R	R	R	R	R	R	R	R				R	R	R	R	
Day before designated legal holiday				R	R	R	R	R	R				R	R	R	R	R	R	R	R									
Designated legal holidays																													
Legend: <div style="display: flex; align-items: center; margin-bottom: 5px;"> <div style="border: 1px solid black; width: 20px; height: 15px; display: flex; align-items: center; justify-content: center; margin-right: 5px;">R</div> Two lanes open in direction of travel </div> <div style="display: flex; align-items: center; margin-bottom: 5px;"> <div style="border: 1px solid black; width: 20px; height: 15px; display: flex; align-items: center; justify-content: center; margin-right: 5px;"></div> No work that interferes with public traffic will be allowed </div>																													
REMARKS:																													

Chart No. 21 Ramp Lane Requirements																																								
DIRECTION: Westbound SD-94												LOCATION:. WB Off-ramp to NB RTE 5.												KP: 2.697																
												a.m.												p.m.																
FROM HOUR TO HOUR												12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12				
Mondays through Thursdays												R	R	R	R	R																				R	R	R		
Fridays												R	R	R	R	R																								
Saturdays																R	R	R	R	R																				
Sundays																R	R	R	R	R	R	R																R	R	R
Day before designated legal holiday												R	R	R	R	R																								
Designated legal holidays																																								
<p>Legend:</p> <div style="display: flex; align-items: center; margin-bottom: 5px;"> <div style="border: 1px solid black; width: 20px; height: 15px; display: inline-block; margin-right: 5px;"></div> R One lane open in direction of travel </div> <div style="display: flex; align-items: center; margin-bottom: 5px;"> <div style="border: 1px solid black; width: 20px; height: 15px; display: inline-block; margin-right: 5px;"></div> No work that interferes with public traffic will be allowed </div>																																								
REMARKS:																																								

Chart No. 22 Ramp Lane Requirements																																						
DIRECTION: Westbound SD-94												LOCATION:. WB Off-ramp to 25 th St. WB On-ramp from 28 th St. WB On-ramp from 32 nd / Broadway												KP: 3.138 3.647 4.350														
Northbound SD-15												NB Off-ramp to WB RTE 94												3.709														
												a.m.												p.m.														
FROM HOUR TO HOUR												12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12		
Mondays through Thursdays												R	R	R	R	R					R	R	R	R	R	R	R								R	R	R	
Fridays												R	R	R	R	R					R	R	R	R	R	R	R											
Saturdays																R	R	R	R	R	R	R	R	R	R	R	R	R	R									
Sundays																R	R	R	R	R	R	R	R	R	R	R	R	R	R							R	R	R
Day before designated legal holiday												R	R	R	R	R					R	R	R	R	R	R	R	R										
Designated legal holidays																																						
<p>Legend:</p> <div style="display: flex; align-items: center; margin-bottom: 5px;"> <div style="border: 1px solid black; width: 20px; height: 15px; display: inline-block; margin-right: 5px;"></div> R Ramp may be closed </div> <div style="display: flex; align-items: center; margin-bottom: 5px;"> <div style="border: 1px solid black; width: 20px; height: 15px; display: inline-block; margin-right: 5px;"></div> No work that interferes with public traffic will be allowed </div>																																						
<p>REMARKS:</p> <p>Detour NB RTE 15 to WB RTE 94 traffic via NB RTE 15 Off-ramp to Market St. thence westerly on Market St. to Broadway thence northerly on Broadway to WB RTE 94 On-ramp from Broadway. NOTE: Place Portable Changeable Message Sign (PCMS) on NB RTE 15 - at Imperial Ave. UC - to warn motorists of ramp closure/ detour ahead.</p> <p>No two consecutive on-ramps shall be closed at the same time.</p>																																						

Chart No. 23 Ramp Lane Requirements																													
DIRECTION: Westbound SD-94				LOCATION:.. WB On-ramp from Home Ave.												KP: 5.648													
				a.m.												p.m.													
FROM HOUR TO HOUR				12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	
Mondays through Thursdays				R	R	R	R	R																			R	R	R
Fridays				R	R	R	R	R																					
Saturdays								R	R	R	R	R																	
Sundays								R	R	R	R	R	R	R													R	R	R
Day before designated legal holiday				R	R	R	R	R																					
Designated legal holidays																													
Legend: <div style="display: flex; align-items: center; margin-bottom: 5px;"> <div style="border: 1px solid black; width: 20px; height: 15px; display: flex; align-items: center; justify-content: center; margin-right: 5px;">R</div> Ramp may be closed </div> <div style="display: flex; align-items: center; margin-bottom: 5px;"> <div style="border: 1px solid black; width: 20px; height: 15px; display: flex; align-items: center; justify-content: center; margin-right: 5px;"></div> No work that interferes with public traffic will be allowed </div>																													
REMARKS:																													

Chart No. 24 Ramp Lane Requirements																													
DIRECTION: Northbound SD-805				LOCATION:.. NB Off-ramp to WB RTE 94												KP: 21.428													
				a.m.												p.m.													
FROM HOUR TO HOUR				12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	
Mondays through Thursdays				1	1	1	1	1						1	1	1	1	1	1	1							1	1	1
Fridays				1	1	1	1	1						1	1	1	1	1	1										
Saturdays								1	1	1	1	1	1	1	1	1	1	1	1	1	1								
Sundays								1	1	1	1	1	1	1	1	1	1	1	1	1	1					1	1	1	
Day before designated legal holiday				1	1	1	1	1						1	1	1	1	1	1	1									
Designated legal holidays																													
Legend: <div style="display: flex; align-items: center; margin-bottom: 5px;"> <div style="border: 1px solid black; width: 20px; height: 15px; display: flex; align-items: center; justify-content: center; margin-right: 5px;">1</div> One lane open in direction of travel </div> <div style="display: flex; align-items: center; margin-bottom: 5px;"> <div style="border: 1px solid black; width: 20px; height: 15px; display: flex; align-items: center; justify-content: center; margin-right: 5px;"></div> No work that interferes with public traffic will be allowed </div>																													
REMARKS:																													

Chart No. 25																																		
Two-Lane Conventional Highway Lane Requirements																																		
Direction: Eastbound and Westbound												Location: "G" Street "Ash Street"																						
												a.m.												p.m.										
FROM HOUR TO HOUR	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12									
Mondays through Thursdays										1	1	1	1	1	1	1																		
Fridays										1	1	1	1	1	1	1																		
Saturdays										1	1	1	1	1	1	1	1	1																
Sundays										1	1	1	1	1	1	1	1	1																
Day before designated legal holiday										1	1	1	1	1	1	1	1																	
Designated legal holidays																																		

Legend:

1

A minimum of one paved traffic lane, not less than 3.60 m wide, shall be open for use by public traffic each direction of travel

No work that interferes with public traffic will be allowed

REMARKS:

Chart No. 26																																		
Multilane Lane Requirements																																		
Direction: Southbound SD-75												Location: Glorietta Blvd. to 0.23 km N. of Toll Gate																						
												a.m.												p.m.										
FROM HOUR TO HOUR	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12									
Mondays through Thursdays	2	2	2	2	2				2	2	2	2	2	2	2								2	2	2									
Fridays	2	2	2	2	2				2	2	2	2	2	2	2																			
Saturdays				2	2	2	2	2	2	2	2	2	2	2	2	2	2	2																
Sundays				2	2	2	2	2	2	2	2	2	2	2	2	2	2	2					2	2	2									
Day before designated legal holiday	2	2	2	2	2				2	2	2	2	2	2	2																			
Designated legal holidays																																		

Legend:

2

Two adjacent lanes open in direction of travel

No lane closure allowed

REMARKS:

KP: 32.41 / 32.84

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10-1.15 CLOSURE REQUIREMENTS AND CONDITIONS

Lane closures shall conform to the provisions in "Maintaining Traffic" of these special provisions and these special provisions.

The term closure, as used herein, is defined as the closure of a traffic lane or lanes, including ramp or connector lanes, within a single traffic control system.

The Contractor shall furnish a sufficient number of special portable freeway detour signs as shown on the plans to be used on the detour routes as directed by the Engineer.

CLOSURE SCHEDULE

By Noon Monday, the Contractor shall submit a written schedule of planned closures for the following week period, defined as Friday Noon through the following Friday Noon.

The Closure Schedule shall show the locations and times when the proposed closures are to be in effect. The Contractor shall use the Closure Schedule request forms furnished by the Engineer. Closure Schedules submitted to the Engineer with incomplete, unintelligible or inaccurate information will be returned for correction and resubmittal. The Contractor will be notified of disapproved closures or closures that require coordination with other parties as a condition of approval.

Amendments to the Closure Schedule, including adding additional closures, shall be submitted to the Engineer, in writing, at least 3 working days in advance of a planned closure. Approval of amendments to the Closure Schedule will be at the discretion of the Engineer.

The Contractor shall confirm, in writing, all scheduled closures by no later than 8:00 a.m. 3 working days prior to the date on which the closure is to be made. Approval or denial of scheduled closures will be made no later than 4:00 p.m. 2 working days prior to the date on which the closure is to be made. Closures not confirmed or approved will not be allowed.

Ramps may be closed only if signed for closing 3 days in advance. The Contractor shall notify the Engineer not less than 5 calendar days prior to signing the ramp. If the ramp is not closed on the posted day, the closure shall be changed to allow 3 days advance notice before closure.

Confirmed closures that are cancelled due to unsuitable weather may be rescheduled at the discretion of the Engineer for the following working day.

CONTINGENCY PLAN

The Contractor shall prepare a contingency plan for reopening closures to public traffic. The Contractor shall submit the contingency plan for a given operation to the Engineer within one working day of the Engineer's request.

LATE REOPENING OF CLOSURES

If a closure is not reopened to public traffic by the specified time, work shall be suspended in conformance with the provisions in Section 8-1.05, "Temporary Suspension of Work," of the Standard Specifications. The Contractor shall not make any further closures until the Engineer has accepted a work plan, submitted by the Contractor, that will insure that future closures will be reopened to public traffic at the specified time. The Engineer will have 2 working days to accept or reject the Contractor's proposed work plan. The Contractor will not be entitled to any compensation for the suspension of work resulting from the late reopening of closures.

COMPENSATION

The Contractor shall notify the Engineer of any delay in the Contractor's operations due to the following conditions, and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of those conditions, and the Contractor's loss due to that delay could not have been avoided by rescheduling the affected closure or by judicious handling of forces, equipment and plant, the delay will be considered a right of way delay within the meaning of Section 8-1.09, "Right of Way Delays," and compensation for the delay will be determined in conformance with the provisions in Section 8-1.09:

- A. The Contractor's proposed Closure Schedule is denied and his planned closures are within the time frame allowed for closures in "Maintaining Traffic" of these special provisions, except that the Contractor will not be entitled to any compensation for amendments to the Closure Schedule that are not approved.
- B. The Contractor is denied a confirmed closure.

Should the Engineer direct the Contractor to remove a closure prior to the time designated in the approved Closure Schedule, any delay to the Contractor's schedule due to removal of the closure will be considered a right of way delay within the meaning of Section 8-1.09, "Right of Way Delays," and compensation for the delay will be determined in conformance with the provisions in Section 8-1.09.

Furnishing, posting, maintaining, and removing special detour signs shall be considered as included in the contract lump sum price paid for traffic control system and no additional compensation will be allowed therefor.

10-1.16 TRAFFIC CONTROL SYSTEM FOR LANE CLOSURE

A traffic control system shall consist of closing traffic lanes and ramps in conformance with the details shown on the plans, the provisions in Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications, the provisions under "Maintaining Traffic" and "Construction Area Signs" of these special provisions, and these special provisions.

The provisions in this section will not relieve the Contractor of responsibility for providing additional devices or taking measures as may be necessary to comply with the provisions in Section 7-1.09, "Public Safety," of the Standard Specifications.

During traffic stripe operations and pavement marker placement operations using bituminous adhesive, traffic shall be controlled, at the option of the Contractor, with either stationary or moving lane closures. During other operations, traffic shall be controlled with stationary lane closures. Attention is directed to the provisions in Section 84-1.04, "Protection From Damage," and Section 85-1.06, "Placement," of the Standard Specifications.

If components in the traffic control system are displaced or cease to operate or function as specified, from any cause, during the progress of the work, the Contractor shall immediately repair the components to the original condition or replace the components and shall restore the components to the original location.

STATIONARY LANE CLOSURE

When lane and ramp closures are made for work periods only, at the end of each work period, components of the traffic control system, except portable delineators placed along open trenches or excavation adjacent to the traveled way, shall be removed from the traveled way and shoulder. If the Contractor so elects, the components may be stored at selected central locations, designated by the Engineer within the limits of the highway right of way.

Each vehicle used to place, maintain and remove components of a traffic control system on multilane highways shall be equipped with a Type II flashing arrow sign which shall be in operation when the vehicle is being used for placing, maintaining or removing the components. Vehicles equipped with Type II flashing arrow sign not involved in placing, maintaining or removing the components when operated within a stationary type lane closure shall only display the caution display mode. The sign shall be controllable by the operator of the vehicle while the vehicle is in motion. The flashing arrow sign shown on the plans shall not be used on the vehicles which are doing the placing, maintaining and removing of components of a traffic control system and shall be in place before a lane closure requiring the sign's use is completed.

MOVING LANE CLOSURE

Flashing arrow signs used in moving lane closures shall be truck-mounted. Changeable message signs used in moving lane closure operations shall conform to the provisions in Section 12-3.12, "Portable Changeable Message Signs," of the Standard Specifications, except the signs shall be truck-mounted and the full operation height of the bottom of the sign may be less than 2.1 m above the ground, but should be as high as practicable.

Truck-mounted attenuators (TMA) for use in moving lane closures shall be any of the following approved models, or equal:

- A. Hexfoam TMA Series 3000, Alpha 1000 TMA Series 1000 and Alpha 2001 TMA Series 2001, manufactured by Energy Absorption Systems, Inc., One East Wacker Drive, Chicago, IL 60601-2076, Telephone (312) 467-6750.
 - 1. Distributor (Northern): Traffic Control Service, Inc., 8585 Thys Court, Sacramento, CA 95828, Telephone 1-800-884-8274, FAX (916) 387-9734.
 - 2. Distributor (Southern): Traffic Control Service, Inc., 1881 Betmor Lane, Anaheim, CA 92805, Telephone 1-800-222-8274.
- B. Cal T-001 Model 2 or Model 3, manufacturer and distributor: Hexcel Corporation, 11711 Dublin Boulevard, P.O. Box 2312, Dublin, CA 94568, Telephone (510) 828-4200.
- C. Renco Rengard Model Nos. CAM 8-815 and RAM 8-815, manufacturer and distributor: Renco Inc., 1582 Pflugerville Loop Road, P.O. Box 730, Pflugerville, TX 78660-0730, Telephone 1-800-654-8182.

Each TMA shall be individually identified with the manufacturer's name, address, TMA model number, and a specific serial number. The names and numbers shall each be a minimum 13 mm high and located on the left (street) side at the lower front corner. The TMA shall have a message next to the name and model number in 13 mm high letters which states, "The bottom of this TMA shall be ____ mm \pm ____ mm above the ground at all points for proper impact performance." Any TMA which is damaged or appears to be in poor condition shall not be used unless recertified by the manufacturer. The Engineer shall be the sole judge as to whether used TMAs supplied under this contract need recertification. Each unit shall be certified by the manufacturer to meet the requirements for TMA in conformance with the standards established by the Transportation Laboratory.

Approvals for new TMA designs proposed as equal to the above approved models shall be in conformance with the procedures (including crash testing) established by the Transportation Laboratory. For information regarding submittal of new designs for evaluation contact: Transportation Laboratory, 5900 Folsom Boulevard, Sacramento, California 95819.

New TMAs proposed as equal to approved TMAs or approved TMAs determined by the Engineer to need recertification shall not be used until approved or recertified by the Transportation Laboratory.

PAYMENT

The contract lump sum price paid for traffic control system shall include full compensation for furnishing all labor, materials (including signs), tools, equipment, and incidentals, and for doing all the work involved in placing, removing, storing, maintaining, moving to new locations, replacing and disposing of the components of the traffic control system shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

The adjustment provisions in Section 4-1.03, "Changes," of the Standard Specifications shall not apply to the item of traffic control system. Adjustments in compensation for traffic control system will be made only for increased or decreased traffic control system required by changes ordered by the Engineer and will be made on the basis of the cost of the increased or decreased traffic control necessary. The adjustment will be made on a force account basis as provided in Section 9-1.03, "Force Account Payment," of the Standard Specifications for increased work and estimated on the same basis in the case of decreased work.

Traffic control system required by work which is classed as extra work, as provided in Section 4-1.03D of the Standard Specifications, will be paid for as a part of the extra work.

10-1.17 TEMPORARY PAVEMENT DELINEATION

Temporary pavement delineation shall be furnished, placed, maintained, and removed in conformance with the provisions in Section 12-3.01, "General," of the Standard Specifications and these special provisions. Nothing in these special provisions shall be construed as reducing the minimum standards specified in the Manual of Traffic Controls published by the Department or as relieving the Contractor from his responsibility as provided in Section 7-1.09, "Public Safety," of the Standard Specifications.

Attention is directed to "Traffic Plastic Drums," elsewhere in these special provisions regarding the use of traffic plastic drums in place of portable delineators or cones.

GENERAL

Whenever the work causes obliteration of pavement delineation, temporary or permanent pavement delineation shall be in place prior to opening the traveled way to public traffic. Lane line or centerline pavement delineation shall be provided at all times for traveled ways open to public traffic. On multilane roadways (freeways and expressways), edgeline delineation shall be provided at all times for traveled ways open to public traffic.

Work necessary, including required lines or marks, to establish the alignment of temporary pavement delineation shall be performed by the Contractor. Surfaces to receive temporary pavement delineation shall be dry and free of dirt and loose material. Temporary pavement delineation shall not be applied over existing pavement delineation or other temporary pavement delineation. Temporary pavement delineation shall be maintained until superseded or replaced with a new pattern of temporary pavement delineation or permanent pavement delineation.

Temporary pavement markers and removeable traffic tape which conflicts with a new traffic pattern or which is applied to the final layer of surfacing or existing pavement to remain in place shall be removed when no longer required for the direction of public traffic, as determined by the Engineer.

TEMPORARY LANELINE AND CENTERLINE DELINEATION

Whenever lanelines and centerlines are obliterated, the minimum laneline and centerline delineation to be provided shall be temporary raised pavement markers placed at longitudinal intervals of not more than 7.3 m. The temporary raised pavement markers shall be the same color as the laneline or centerline the markers replace. Temporary raised pavement markers shall be, at the option of the Contractor, one of the temporary pavement markers listed for short term day/night use (14 days or less) or long term day/night use (6 months or less) in "Approved Traffic Products" of these special provisions.

Temporary raised pavement markers shall be placed in conformance with the manufacturer's instructions and shall be cemented to the surfacing with the adhesive recommended by the manufacturer, except epoxy adhesive shall not be used to place pavement markers in areas where removal of the markers will be required.

Temporary laneline or centerline delineation consisting entirely of temporary raised pavement markers placed on longitudinal intervals of not more than 7.3 m shall be used on lanes open to public traffic for a maximum of 14 days. Prior to the end of the 14 days, the permanent pavement delineation shall be placed. If the permanent pavement delineation is not placed within the 14 days, additional temporary pavement delineation shall be provided at the Contractor's expense. The additional temporary pavement delineation to be provided shall be equivalent to the pattern specified for the permanent pavement delineation for the area, as determined by the Engineer.

Full compensation for furnishing, placing, maintaining, and removing the temporary raised pavement markers used for temporary laneline and centerline delineation and for providing equivalent patterns of permanent traffic lines for these areas when required shall be considered as included in the contract prices paid for the items of work that obliterated the laneline and centerline pavement delineation and no separate payment will be made therefor.

TEMPORARY EDGE LINE DELINEATION

Whenever edgelines are obliterated on multilane roadways (freeways and expressways), the edgeline delineation to be provided for that area adjacent to lanes open to public traffic shall consist of, at the option of the Contractor, either solid 100-mm wide traffic stripe of the same color as the stripe the temporary edgeline delineation replaces or shall consist of traffic cones, portable delineators or channelizers placed at longitudinal intervals not to exceed 30 m.

Traffic stripe (100-mm wide) placed for temporary edgeline delineation, which will require removal, shall consist of temporary removeable construction grade striping and pavement marking tape listed in "Approved Traffic Products" of these special provisions. Temporary removeable construction grade striping and pavement marking tape when used shall be applied in conformance with the manufacturer's recommendations. Where removal of the 100-mm wide traffic stripe will not be required, painted traffic stripe used for temporary edgeline delineation shall conform to "Paint Traffic Stripes and Pavement Markings" of these special provisions, Section 84-3, "Painted Traffic Stripes And Pavement Markings," of the Standard Specifications, except for payment and the number of coats shall be, at the option of the Contractor, either one or 2 coats. The quantity of painted traffic stripe used for temporary edgeline delineation will not be included in the quantities of paint traffic stripe to be paid for.

The lateral offset for traffic cones, portable delineators or channelizers used for temporary edgeline delineation shall be determined by the Engineer. If traffic cones or portable delineators are used as temporary pavement delineation for edgelines, the Contractor shall provide personnel to remain at the project site to maintain the cones or delineators during hours of the day that the cones or delineators are in use.

Channelizers used for temporary edgeline delineation shall be the surface mounted type and shall be orange in color. Channelizer bases shall be cemented to the pavement in the same manner provided for cementing pavement markers to pavement in "Pavement Markers" of these special provisions, except epoxy adhesive shall not be used to place channelizers on the top layer of pavement. Channelizers shall be, at the Contractor's option, one of the surface mount types (900 mm) listed in "Approved Traffic Products" of these special provisions.

Temporary edgeline delineation shall be removed when no longer required for the direction of public traffic, as determined by the Engineer.

Full compensation for furnishing, placing, maintaining, and removing temporary edgeline delineation shall be considered as included in the contract prices paid for the items of work that obliterated the edgeline pavement delineation and no separate payment will be made therefor.

10-1.18 PORTABLE CHANGEABLE MESSAGE SIGN

Portable changeable message signs shall be furnished, placed, operated, and maintained at those locations shown on the plans or where designated by the Engineer in conformance with the provisions in Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications and these special provisions.

The Contractor shall have 2 portable changeable message signs on the project at all times.

10-1.19 TEMPORARY RAILING

Temporary railing (Type K) shall be placed as shown on the plans, as specified in the Standard Specifications or these special provisions or where ordered by the Engineer and shall conform to the provisions in Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications and these special provisions.

Reflectors on temporary railing (Type K) shall conform to the provisions in "Approved Traffic Products" of these special provisions.

Temporary railing (Type K) shall conform to the details shown on Standard Plan T3. Temporary railing (Type K) fabricated prior to January 1, 1993, and conforming to 1988 Standard Plan B11-30 may be used, provided the fabrication date is printed on the required Certificate of Compliance.

Attention is directed to "Public Safety" of these special provisions.

Temporary railing (Type K) placed in conformance with the provisions in "Public Safety" of these special provisions will be neither measured nor paid for.

10-1.20 TRAFFIC PLASTIC DRUMS

Traffic plastic drums shall conform to the requirements for traffic control devices in Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications and these special provisions.

Traffic plastic drums shall be constructed of low-density polyethylene material and shall be flexible or collapsible upon impact by a vehicle. The traffic plastic drum shall have a weighted base that will separate from the drum. The base shall be of such shape as to preclude rolling upon impact by a vehicle. The base shall be of sufficient weight to maintain the drum in position and upright. The base or external ballast rings shall not exceed 101.6 mm in height, and drum rings shall not exceed 965.2 mm maximum in diameter. The base or external rings placed over and around the drum, resting on the pavement or ground shall contain the ballast for the drums. Ballast for drums shall be sand or water, except sand shall be used in areas susceptible to freezing. The base shall have drain holes to prevent the accumulation of water. Sand bags shall not be used as ballast for drums.

The body of the traffic plastic drum shall be of a fluorescent orange or predominately orange color. Drums shall be a minimum of 914.4 mm in height above the traveled way, and have at least an 457.2 mm minimum width, regardless of orientation.

The markings on drums shall be horizontal, circumferential, alternating orange and white reflective bands 101.6 to 152.4 mm wide. Each drum shall have a minimum of 2 orange and 2 white bands. The top of the uppermost reflective band shall be no lower than 152.4 mm from the top of the drum. Any non-reflective spaces between the bands shall not exceed 50.8 mm in width. The reflective sheeting shall conform to the provisions in "Approved Traffic Products" elsewhere in these special provisions.

Only one type of traffic plastic drum shall be used on the project. The type of traffic plastic drum proposed for use on the project shall be submitted to the Engineer for approval, prior to placement on the project.

In curvilinear alignment traffic plastic drums shall be used only on one side of the traveled way. Traffic plastic drums shall be placed on the alignment and location shown on the plans, or directed by the Engineer. Traffic plastic drums shall be placed uniformly, straight on tangent alignment and on a true arc on curved alignment. All layout work necessary to place the traffic plastic drums to the proper alignment shall be performed by the Contractor.

If traffic plastic drums are displaced or are not in an upright position, from any cause, the traffic plastic drums shall immediately be replaced or restored to their original location, in an upright position, by the Contractor.

At the option of the Contractor, where portable delineators, cones or Type I or II barricades are specified in the specifications or shown on the plans, traffic plastic drums may be used in place of those portable delineators, cones or Type I or II barricades.

At the completion of the project, traffic plastic drums shall become the property of the Contractor and removed from the site of the work.

Traffic plastic drums shall be installed as shown on the plans when temporary railing (Type K) is placed as required by "Public Safety" elsewhere in these special provisions.

Traffic plastic drums placed in accordance with the provisions in "Public Safety" elsewhere in these special provisions will not be measured nor paid for.

10-1.21 TEMPORARY CRASH CUSHION MODULE

This work shall consist of furnishing, installing, and maintaining sand filled temporary crash cushion modules in groupings or arrays at each location shown on the plans, as specified in these special provisions or where designated by the Engineer. The grouping or array of sand filled modules shall form a complete sand filled temporary crash cushion in conformance with the details shown on the plans and these special provisions.

Attention is directed to "Public Safety" of these special provisions.

GENERAL

Whenever the work or the Contractor's operations establishes a fixed obstacle, the exposed fixed obstacle shall be protected with a sand filled temporary crash cushion. The sand filled temporary crash cushion shall be in place prior to opening the lanes adjacent to the fixed obstacle to public traffic.

Sand filled temporary crash cushions shall be maintained in place at each location, including times when work is not actively in progress. Sand filled temporary crash cushions may be removed during a work period for access to the work provided that the exposed fixed obstacle is 4.6 m or more from a lane carrying public traffic and the temporary crash cushion is reset to protect the obstacle prior to the end of the work period in which the fixed obstacle was exposed. When no longer required, as determined by the Engineer, sand filled temporary crash cushions shall be removed from the site of the work.

MATERIALS

At the Contractor's option, the modules for use in sand filled temporary crash cushions shall be either Energite III Inertial Modules, Fitch Inertial Modules or Traffix Sand Barrels manufactured after March 31, 1997, or equal:

- A. Energite III Inertial Modules, manufactured by Energy Absorption Systems, Inc., One East Wacker Drive, Chicago, IL 60601-2076, Telephone 1-312-467-6750, FAX 1-800-770-6755.
 - 1. Distributor (Northern): Traffic Control Service, Inc., 8585 Thys Court, Sacramento, CA 95828, Telephone 1-800-884-8274, FAX 1-916-387-9734
 - 2. Distributor (Southern): Traffic Control Service, Inc., 1881 Betmor Lane, Anaheim, CA 92805, Telephone 1-800-222-8274, FAX 1-714-937-1070.
- B. Fitch Inertial Modules, manufactured by Roadway Safety Service, Inc., 1050 North Rand Road, Wauconda, IL 60084, Telephone 1-800-426-0839, FAX 1-847-487-9820.
 - 1.. Distributor (Northern): Traffic Control Service, Inc., 8585 Thys Court, Sacramento, CA 95828, Telephone 1-800-884-8274, FAX 1-916-387-9734
 - 2. Distributor (Southern): Traffic Control Service, Inc., 1881 Betmor Lane, Anaheim, CA 92805, Telephone 1-800-222-8274, FAX 1-714-937-1070.
- C. Traffix Sand Barrels, manufactured by Traffix Devices, Inc., 220 Calle Pintesresco, San Clemente, CA 92672, Telephone 1-949-361-5663, FAX 1-949-361-9205.
 - 1. Russ Enterprises, Inc., 1533 Berger Drive, San Jose, CA 95112, Telephone 1-408-287-4303, FAX 1-408-287-1929.
 - 2. Statewide Safety, P.O. Box 1440, Pismo Beach, CA 93448, Telephone 1-800-559-7080, FAX 1-805-929-5786.

Modules contained in each temporary crash cushion shall be of the same type at each location. The color of the modules shall be the standard yellow color, as furnished by the vendor, with black lids. The modules shall exhibit good workmanship free from structural flaws and objectionable surface defects. The modules need not be new. Good used undamaged modules conforming to color and quality of the types specified herein may be utilized. If used Fitch modules requiring a seal are furnished, the top edge of the seal shall be securely fastened to the wall of the module by a continuous strip of heavy duty tape.

Modules shall be filled with sand in conformance with the manufacturer's directions, and to the sand capacity in kilograms for each module shown on the plans. Sand for filling the modules shall be clean washed concrete sand of commercial quality. At the time of placing in the modules, the sand shall contain not more than 7 percent water as determined by California Test 226.

Modules damaged due to the Contractor's operations shall be repaired immediately by the Contractor at the Contractor's expense. Modules damaged beyond repair, as determined by the Engineer, due to the Contractor's operations shall be removed and replaced by the Contractor at the Contractor's expense.

INSTALLATION

Temporary crash cushion modules shall be placed on movable pallets or frames conforming to the dimensions shown on the plans. The pallets or frames shall provide a full bearing base beneath the modules. The modules and supporting pallets or frames shall not be moved by sliding or skidding along the pavement or bridge deck.

A Type R or P marker panel shall be attached to the front of the crash cushion as shown on the plans, when the closest point of the crash cushion array is within 3.6 m of the traveled way. The marker panel, when required, shall be firmly fastened to the crash cushion with commercial quality hardware or by other methods determined by the Engineer.

At the completion of the project, temporary crash cushion modules, sand filling, pallets or frames, and marker panels shall become the property of the Contractor and shall be removed from the site of the work. Temporary crash cushion modules shall not be installed in the permanent work.

MEASUREMENT AND PAYMENT

Temporary crash cushion modules placed in conformance with the provisions in "Public Safety" of these special provisions will not be measured nor paid for.

10-1.22 EXISTING HIGHWAY FACILITIES

The work performed in connection with various existing highway facilities shall conform to the provisions in Section 15, "Existing Highway Facilities," of the Standard Specifications and these special provisions.

Residue from saw cutting operations shall be removed from the pavement surface by vacuuming or other approved method and shall not be allowed to flow across the pavement nor be left on the surface of the pavement. Residue from saw cutting operations shall be disposed of outside the highway right of way in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside of the Highway Right of Way," of the Standard Specifications.

Full compensation for conforming to the requirements for the control, removal and disposal of residue resulting from saw cutting operations shall be considered as included in the contract price paid for the item of work involved and no additional compensation will be allowed therefor.

Plans of the existing bridges may be requested by fax from the Office of Structure Maintenance and Investigations, 1801 30th Street, Sacramento, California, Fax (916) 227-8357, and are available at the Office of Structure Maintenance and Investigations, Los Angeles, California, Telephone (213) 897-6156.

Plans of the existing bridges available to the Contractor are reproductions of the original contract plans with significant changes noted and working drawings and do not necessarily show normal construction tolerances and variances. Where dimensions of new construction required by this contract are dependent on the dimensions of the existing bridges, the Contractor shall verify the controlling field dimensions and shall be responsible for adjusting dimensions of the work to fit existing conditions.

Attention is directed to Section 7-1.06, "Safety and Health Provisions," of the Standard Specifications. Work practices and worker health and safety shall conform to the California Division of Occupational Safety and Health Construction Safety Orders Title 8, of the California Code of Regulations including Section 5158, "Other Confined Space Operations."

REMOVE PAVEMENT MARKER

Existing pavement markers, including underlying adhesive, when no longer required for traffic lane delineation as determined by the Engineer, shall be removed and disposed of.

Full compensation for removing and disposing of pavement markers and underlying adhesive shall be considered as included in the contract price paid per tonne for asphalt concrete (Type A) and no separate payment will be made therefor.

REMOVE ASPHALT CONCRETE DIKE

Existing asphalt concrete dike, where shown on the plans to be removed, shall be removed.

Prior to removing the dike, the outside edge of the asphalt concrete to remain in place shall be cut on a neat line to a minimum depth of 50 mm.

At the Contractor's option, dikes may be removed by the cold plane method. When the cold plane method is selected, saw cutting the outside line to a neat edge will not be required.

The dike shall be removed in such a manner that the surfacing which is to remain in place is not damaged.

The dike shall be disposed of outside the highway right of way in conformance with the provisions in Section 7-1.13 of the Standard Specifications.

RELOCATE ROADSIDE SIGN

Existing roadside signs shall be removed and relocated to the new locations shown on the plans.

Each roadside sign shall be installed at the new location on the same day that the sign is removed from its original location.

Two holes shall be drilled in each existing post as required to provide the breakaway feature shown on the plans.

COLD PLANE ASPHALT CONCRETE PAVEMENT

Existing asphalt concrete pavement shall be cold planed at the locations and to the dimensions shown on the plans.

Planing asphalt concrete pavement shall be performed by the cold planing method. Planing of the asphalt concrete pavement shall not be done by the heater planing method.

Cold planing machines shall be equipped with a cutter head not less than 750 mm in width and shall be operated so that no fumes or smoke will be produced. The cold planing machine shall plane the pavement without requiring the use of a heating device to soften the pavement during or prior to the planing operation.

The depth, width, and shape of the cut shall be as shown on the typical cross sections or as designated by the Engineer. The final cut shall result in a uniform surface conforming to the typical cross sections. The outside lines of the planed area shall be neat and uniform. Planing asphalt concrete pavement operations shall be performed without damage to the surfacing to remain in place.

Planed widths of pavement shall be continuous except for intersections at cross streets where the planing shall be carried around the corners and through the conform lines. Following planing operations, a drop-off of more than 45 mm will not be allowed between adjacent lanes open to public traffic.

Where transverse joints are planed in the pavement at conform lines no drop-off shall remain between the existing pavement and the planed area when the pavement is opened to public traffic. If asphalt concrete has not been placed to the level of existing pavement before the pavement is to be opened to public traffic a temporary asphalt concrete taper shall be constructed. Asphalt concrete for temporary tapers shall be placed to the level of the existing pavement and tapered on a slope of 1:30 (Vertical: Horizontal) or flatter to the level of the planed area.

Asphalt concrete for temporary tapers shall be commercial quality and may be spread and compacted by any method that will produce a smooth riding surface. Temporary asphalt concrete tapers shall be completely removed, including the removal of loose material from the underlying surface, before placing the permanent surfacing. The removed material shall be disposed of outside the highway right of way in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

Operations shall be scheduled so that not more than 7 days shall elapse between the time when the areas are planed and the permanent surfacing is placed.

The material planed from the roadway surface, including material deposited in existing gutters or on the adjacent traveled way, shall be removed and disposed of outside the highway right of way in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications. Removal operations of cold planed material shall be concurrent with planing operations and follow within 15 m of the planer, unless otherwise directed by the Engineer.

Cold plane asphalt concrete pavement will be measured by the square meter. The quantity to be paid for will be the actual area of surface cold planed irrespective of the number of passes required to obtain the depth shown on the plans.

The contract price paid per square meter for cold plane asphalt concrete pavement shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in cold planing asphalt concrete surfacing and disposing of planed material, including furnishing the asphalt concrete for and constructing, maintaining, removing, and disposing of temporary asphalt concrete tapers, as specified in the Standard Specifications and these special provisions and as directed by the Engineer.

EXISTING LOOP DETECTORS AND PULL BOXES

The existing inductive loop detectors and pull boxes on the mainline freeway and shoulders within the project limit shall remain in place.

If part of the loop conductor, including the portion leading to the adjacent pull box and/or the pull box, is damaged by the Contractor's operations, the entire detector loop or pull box shall be replaced at the Contractor's expense. Adjacent loops damaged during the replacement shall also be replaced.

ACCESS OPENING, SOFFIT

Access openings in bridge soffits shall consist of removing portions of existing box girder bridge soffits at the locations and to the dimensions shown on the plans.

A 19-mm deep saw cut shall be made around the perimeter of the soffit areas to be removed.

Bar reinforcing steel shall be removed as shown on the plans. The ends of the remaining bars shall be coated with 2 applications of a zinc-rich primer in the same manner specified for exposed ends of prestressing steel in Section 50-1.05, "Prestressing Steel," of the Standard Specifications.

Within a cell where work is to be performed, existing formwork and miscellaneous concrete that will interfere with the work shall be removed. In addition, when the work is to be done in a cell that adjoins a hinge, all existing forms and sharp projections in the cell between the hinge and 1.5 m past the access opening shall be removed.

All material removed shall become the property of the Contractor and shall be disposed of outside the highway right of way as provided in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

When no longer required, soffit access openings shall be closed as shown on the plans. All materials, including galvanized sheet metal covers, steel hardware, hinges, and corrosion resistant concrete expansion anchorage devices, shall be commercial quality.

Thread locking system shall conform to the provisions in Section 75, "Miscellaneous Metal," of the Standard Specifications.

Unless specified as an option, using deck access openings in lieu of soffit access openings will not be allowed.

Access openings through soffits will be measured and paid for by the unit as access opening, soffit. Openings to be paid for will be determined from actual count of the completed units in place.

The contract unit price paid for access opening, soffit shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in constructing the soffit access opening, complete in place, including closing the soffit access opening and removing forms and miscellaneous concrete, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

REMOVE CONCRETE

Concrete, where shown on the plans to be removed, shall be removed.

Concrete removed shall be disposed of in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

Concrete removed at the following locations will be measured and paid for by the cubic meter, measured before and during removal operations:

- A. Sta. 40+83 to 41+11.

Other concrete to be removed will not be measured nor paid for as remove concrete. Attention is directed to Section 16, "Clearing and Grubbing," and Section 19-1.04, "Removal and Disposal of Buried Man-Made Objects," of the Standard Specifications.

10-1.23 EARTHWORK

Earthwork shall conform to the provisions in Section 19, "Earthwork," of the Standard Specifications and these special provisions.

At the location and to the limits shown on the plans for foundation treatment, material below the bottom of retaining wall footings, shall be removed and replaced with structure backfill. The relative compaction shall not be less than 95 percent. Removal of the material will be measured and paid for as structure excavation (retaining wall) and furnishing, placing and compacting the replacement material will be measured and paid for as structure backfill (retaining wall).

The maintenance vehicle pullouts grading plane shall not be more than 15 mm above the grade established by the Engineer.

A relative compaction, for maintenance vehicle pullouts, of not less than 95 percent shall be obtained for a minimum depth of 150 mm below the grading plane.

No backfill materials shall be deposited against the back of Type 6A retaining walls until the grout has developed a strength of not less than 10 MPa in compression, or until the grout has been in place for 28 days, whichever occurs first.

Surplus excavated material shall become the property of the Contractor and shall be disposed of outside the highway right of way in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

Where a portion of the existing surfacing is to be removed, the outline of the area to be removed shall be cut on a neat line with a power-driven saw to a minimum depth of 50 mm before removing the surfacing. Full compensation for cutting the existing surfacing shall be considered as included in the contract price paid per cubic meter for roadway excavation and no additional compensation will be allowed therefor.

MATERIAL WITH AERIALY DEPOSITED LEAD

Attention is directed to "Aerially Deposited Lead" of these special provisions.

Materials that contain aerially deposited lead in concentrations of less than 1575 milligrams per kilogram (mg/kg) total lead, or less than 500 micrograms per liter (µg/L) soluble lead using deionized water, are designated Type Y materials. Type Y materials shall be excavated to a depth of 0.6 m on Routes 5 and 94 in all proposed maintenance vehicle pullouts. Type Y materials shall be placed and covered with a minimum 300 mm layer of material as shown on the plans.

Materials designated as containing aerially deposited lead are considered selected material and shall be excavated, stockpiled if necessary, and compacted in conformance with the provisions in Section 19-2.07, "Selected Material," of the Standard Specifications. Temporary surplus materials may be generated on this project due to stage construction requirements. Surplus materials shall not be transported outside the project limits. In order to conform to the requirements of these provisions, it may be necessary to stockpile materials for subsequent stages or construct some embankments out of stage or handle the surplus materials more than once.

Excavation, transportation, placement and handling of materials containing aerially deposited lead shall be processed without visible dust. The Contractor shall have a water truck available at all times while performing clearing and grubbing and earthwork operations in work areas containing aerially deposited lead.

The Contractor shall monitor the air quality during excavation operations in accordance with the requirements of the Contractor's health and safety plan prepared in conformance with the provisions of "Aerially Deposited Lead" of these special provisions. Results of the air quality tests shall be made available to the Engineer upon request.

Surplus excavated material containing greater than 1000 mg/kg total lead concentration or greater than 5 mg/L soluble lead, as determined above, will be considered contaminated material with hazardous levels of lead and shall remain the property of the State. The material shall be disposed of at a location designated by the Engineer. Disposal and transportation of contaminated materials with hazardous levels of aerially deposited lead shall be performed in conformance with all applicable State and Federal laws and county and municipal ordinances and regulations regarding hazardous waste. Laws and regulations which govern this work include, but are not limited to:

- A. Health and Safety Code, Division 20, Chapter 6.5 (California Hazardous Waste Control Act),
- B. Title 22, California Code of Regulations, Chapter 30 (Minimum Standard for Management of Hazardous and Extremely Hazardous Materials), and
- C. Title 8, California Code of Regulations.

The Engineer will obtain the EPA Generator Identification Number and the State of California Board of Equalization Identification Number for hazardous material disposal. The Engineer, or the Engineer's designated representative, will sign all hazardous waste manifests.

Transportation and disposal of surplus excavated material that is determined to be contaminated with hazardous levels of aerially deposited lead will be paid for as extra work as provided in Section 4-1.03D of the Standard Specifications. Sampling, analyzing, transporting, and disposing of materials containing aerially deposited lead excavated outside the pay limits of excavation will be at the Contractor's expense.

Full compensation for conforming to the requirements of this section involving materials containing aerially deposited lead, except as otherwise specifically provided in these special provisions, shall be considered as included in the prices paid for the various contract items of work involved and no additional compensation will be allowed therefor.

10-1.24 AGGREGATE BASE

Aggregate base shall be Class 2 and shall conform to the provisions in Section 26, "Aggregate Bases," of the Standard Specifications and these special provisions.

Aggregate base for maintenance vehicle pullouts shall conform to the provisions specified for 19-mm, Maximum, aggregate grading in Section 26-1.02A, "Class 2 Aggregate Base," of the Standard Specifications.

The restriction that the amount of reclaimed material included in Class 2 aggregate base not exceed 50 percent of the total volume of the aggregate used shall not apply. Aggregate for Class 2 aggregate base may include reclaimed glass. Aggregate base incorporating reclaimed glass shall not be placed at locations where surfacing will not be placed over the aggregate base.

10-1.25 ASPHALT CONCRETE

Asphalt concrete shall be Type A and shall conform to the provisions in Section 39, "Asphalt Concrete," of the Standard Specifications and these special provisions.

The amount of asphalt binder used in asphalt concrete placed in dikes shall be increased one percent by mass of the aggregate over the amount of asphalt binder determined for use in asphalt concrete placed on the traveled way.

Aggregate for asphalt concrete dikes shall be in conformance with the provisions for 9.5-mm Maximum grading in Section 39-2.02, "Aggregate," of the Standard Specifications.

If the Contractor selects the batch mixing method, asphalt concrete shall be produced by the automatic batch mixing method in conformance with the provisions in Section 39-3.03A(2), "Automatic Proportioning," of the Standard Specifications.

The area to which paint binder has been applied shall be closed to public traffic. Care shall be taken to avoid tracking binder material onto existing pavement surfaces beyond the limits of construction.

The aggregate from each separate bin used for asphalt concrete, Type A, except for the bin containing the fine material, shall have a Cleanness Value of 57 minimum for contract compliance and a value of 65 minimum for operating range as determined by California Test 227, modified as follows:

- A. Tests will be performed on the material retained on the 2.36-mm sieve from each bin and will not be a combined or averaged result.
- B. Each test specimen will be prepared by hand shaking for 30 seconds, a single loading of the entire sample on a 305-mm diameter, 4.75-mm sieve, nested on top of a 305-mm diameter, 2.36-mm sieve.
- C. Where a coarse aggregate bin contains material which will pass the maximum size specified and is retained on a 9.5-mm sieve, the test specimen mass and volume of wash water specified for 25-mm x 4.75-mm aggregate size will be used.
- D. Samples will be obtained from the weigh box area during or immediately after discharge from each bin of the batching plant or immediately prior to mixing with asphalt in the case of continuous mixers.

E. The Cleanness Value of the test sample from each of the bins will be separately computed and reported.

At drier-drum and continuous plants with cold feed control, Cleanness Value test samples will be obtained from the discharge of each coarse aggregate storage. An aggregate sampling device shall be provided which will provide a 25-kg sample of each coarse aggregate.

If the results of the Cleanness Value tests do not meet the requirements specified for operating range but meet the contract compliance requirements, placement of the material may be continued for the remainder of that day. However, another day's work may not be started until tests, or other information, indicate to the satisfaction of the Engineer that the next material to be used in the work will comply with the requirements specified for operating range.

If the results of the Cleanness Value tests do not meet the requirements specified for contract compliance, the material which is represented by these tests shall be removed. However, if requested by the Contractor and approved by the Engineer, material having a Cleanness Value of 48 or greater may remain in place and accepted on the basis of a reduced payment for material left in place.

Asphalt concrete that is accepted on the basis of reduced payment will be paid for at the contract prices for the items of asphalt concrete involved multiplied by the following factors:

Test Value	Pay Factor
56	0.90
55	0.85
54	0.80
53	0.75
52	0.70
51	0.65
50	0.60
49	0.55
48	0.50

If asphalt concrete is accepted on the basis of reduced payment due to a Cleanness Value of 48 to 56 and also accepted on the basis of aggregate grading or Sand Equivalent tests not meeting the contract compliance requirements, the reduced payment for Cleanness Value shall apply and payment by the Contractor to the State for asphalt concrete not meeting the contract compliance requirements for aggregate grading or Sand Equivalent shall not apply.

10-1.26 TYPE 6 RETAINING WALL

Type 6 retaining wall, consisting of a reinforced concrete footing and either a reinforced concrete stem or a reinforced concrete masonry unit stem, shall conform to the provisions in Section 51, "Concrete Structures," and Section 52, "Reinforcement," of the Standard Specifications and these special provisions.

Wall stems may be constructed of reinforced concrete masonry units.

Hollow load-bearing concrete masonry units shall conform to the requirements in ASTM Designation: C 90, Type II and shall be of uniform color and size.

Portland cement for grout and mortar shall conform to Section 90-2.01, "Portland Cement," of the Standard Specifications or shall conform to the requirements in ASTM Designation: C 150, Type II.

Hydrated lime shall conform to the requirements in ASTM Designation: C 207, Type S.

Mortar sand shall be commercial quality.

Caulking, for sealing expansion joints, shall be a non-sag polysulfide or polyurethane material conforming to the provisions in Federal Specification TT-S-230, Type II.

Mortar for laying masonry units shall consist, by volume, of one part portland cement, 0 to 0.5 parts hydrated lime, and 2.25 to 3 parts mortar sand. Sufficient water shall be added to make a workable mortar. Each batch of mortar shall be accurately measured and thoroughly mixed. Mortar shall be freshly mixed as required. Mortar shall not be re-tempered more than one hour after mixing.

Aggregate for grout used to fill masonry units shall consist of fine aggregate and coarse aggregate conforming to the provisions in Section 90-2.02, "Aggregates," of the Standard Specifications. At least 20 percent of the aggregate by mass shall be coarse aggregate. The Contractor shall determine the grading except that between 90 percent and 100 percent of the combined grading shall pass the 12.5-mm sieve.

At the option of the Contractor, grout for filling masonry units may be proportioned either by volume or mass. Grout shall contain only enough water to cause it to flow and fill the voids without segregation. The maximum amount of free water shall not exceed 0.7 times the mass of the cement.

Grout proportioned by volume shall consist of at least one part portland cement and 4.5 parts aggregate. Aggregate volumes shall be based on a loose, air-dry condition.

Grout proportioned by mass shall contain at least 350 kg of portland cement per cubic meter.

Concrete masonry unit construction shall be true and plumb. Recesses in the units for horizontal reinforcement shall be provided.

Cleanout openings shall be provided at the bottoms of all cells where the height of wall is in excess of 1.25 m. The cleanouts shall be sealed before filling with grout, after inspection.

Mortar joints shall be approximately 10 mm wide. Units shall be laid with full mortar coverage of the face in both the vertical and horizontal joints, except where weep holes are specified. Vertical joints shall be shoved tight. Exposed joints shall be concave, tooled smooth.

All cells in the hollow unit masonry shall be filled solidly with grout. All grout shall be consolidated at the time of pouring by puddling or vibrating. The top lift of grout shall be placed approximately 25 mm below the top of the units, to provide for a cement mortar cap.

The cement mortar cap shall conform to the provisions for mortar.

Splashing, staining or spotting on the exposed face of the wall stem shall be removed.

Pay quantities of the reinforced concrete masonry unit stem for Type 6 retaining walls will be determined by the square meter of completed wall stem, including the cap, measured along the horizontal length and the vertical height from the top of footing to the top of the wall.

The contract price paid per square meter for retaining wall stem (Type 6) shall include full compensation for furnishing all labor, materials, (including concrete for the footing and reinforcement for the footing and wall stem), tools, equipment, and incidentals, and for doing all the work involved in constructing the reinforced concrete masonry unit retaining wall stem and footing, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.27 CORE CONCRETE

Coring concrete shall consist of coring holes through reinforced concrete bridge members as shown on the plans and in conformance with these special provisions.

Immediately after coring, the concrete cores shall be identified by the Contractor with a description of the core locations and submitted to the Engineer for inspection.

The holes shall be cored by methods that will not shatter or damage the concrete adjacent to the holes.

Water for core drilling operations shall be from the local domestic water supply or shall not contain more than 1000 parts per million of chlorides as Cl, nor more than 1300 parts per million of sulfates as SO₄, nor shall the water contain any impurities in a sufficient amount that would cause discoloration of the concrete or produce etching of the surface.

Water from core drilling operations shall not be permitted to fall on public traffic, to flow across shoulders or lanes occupied by public traffic, or to flow into gutters or other drainage facilities.

Coring concrete will be measured by the meter as core concrete of the sizes listed in the Engineer's Estimate. The cored concrete will be measured along the centerline of the hole without deduction for expansion joints.

The contract price paid per meter for core concrete of the sizes listed in the Engineer's Estimate shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in coring the holes, removal of portions of interfering falsework, including control of water from core drilling and repairing any damaged reinforcement, as shown on the plans, as specified in these special provisions, and as directed by the Engineer.

10-1.28 REINFORCEMENT

Reinforcement shall conform to the provisions in Section 52, "Reinforcement," of the Standard Specifications.

A Certificate of Compliance conforming to the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications shall also be furnished for each shipment of epoxy-coated bar reinforcement or wire reinforcement certifying that the coated reinforcement conforms to the requirements in ASTM Designation: A 775/A 775M or A 884/A 884M, respectively, and the provisions in Section 52-1.02B, "Epoxy-coated Bar Reinforcement," of the Standard Specifications. The Certificate of Compliance shall include all the certifications specified in ASTM Designation: A 775/A 775M or A 884/A 884M, respectively, and a statement that the coating material has been prequalified by acceptance testing performed by the Valley Forge Laboratories, Inc., Devon, Pennsylvania.

10-1.29 MISCELLANEOUS CONCRETE CONSTRUCTION

Minor concrete (curb) shall conform to the provisions in Section 73, "Concrete Curbs and Sidewalks," of the Standard Specifications.

10-1.30 MISCELLANEOUS METAL (BRIDGE)

Miscellaneous metal (bridge) shall conform to the provisions for miscellaneous bridge metal in Section 75, "Miscellaneous Metal," of the Standard Specifications and these special provisions.

Miscellaneous metal (bridge) shall consist of the miscellaneous bridge metal items listed in Section 75-1.03, "Miscellaneous Bridge Metal," of the Standard Specifications, and the following:

Hanger and pipe straps, as detailed on plans.

Anchor systems for pipe hangers shall be hot-dip galvanized.

Holes for anchors shall be drilled using non-percussion type equipment. If reinforcement is encountered during drilling before the specified depth is attained, the Engineer shall be notified. Unless the Engineer approves coring through the reinforcement, the hole will be rejected and a new hole, in which reinforcement is not encountered, shall be drilled adjacent to the rejected hole to the depth shown on the plans. The rejected hole shall be plugged with color-matching PCC mortar. All metal parts of anchorage devices shall be fabricated from stainless steel conforming to the requirements of ASTM Designation: A 276, Type 304 or 316.

Full compensation for miscellaneous metal (bridge) shall be considered as included in the contract unit price paid per meter for the conduit involved and no separate payment will be made therefor.

10-1.31 CHAIN LINK WALK GATE

Chain link walk gates shall be Type CL-1.8 conforming to the provisions in Section 80, "Fences," of the Standard Specifications and these special provisions.

Gates shall be installed in existing fences at the locations shown on the plans. Gate installations shall be complete with gate post, latch post, concrete footings, braces, truss rods, and hardware. Gate and latch posts shall be braced to the next existing line post as shown on the plans.

At each gate location, an existing line post shall be removed and the new gate installed so that the gate is centered on the post hole of the removed post. Holes resulting from the removal of line posts shall be backfilled.

Gate mounting and latching hardware shall not contain open-end slots for the fastening bolts.

Chain link fabric for gates shall be of the same mesh size as the existing fence in which the gates are installed.

Openings made in existing fences for installation of gates shall be closed during the working day in which the openings are made and when work is not in progress. Temporary closures shall be made with the existing fence fabric or with additional 1.83-m chain link fabric as directed by the Engineer.

Full compensation for making the openings in existing fences, for temporary closing of the openings (including furnishing additional fence fabric if necessary), and for new posts, footings, hardware, braces, and truss rods shall be considered as included in the contract unit price paid for 1.2-m chain link gate (Type CL-1.8) and no additional compensation will be allowed therefor.

10-1.32 CABLE RAILING

Cable railing shall conform to the provisions in Section 83-1, "Railings," of the Standard Specifications.

10-1.33 PAINT TRAFFIC STRIPE AND PAVEMENT MARKING

Painted traffic stripes (traffic lines) shall be applied in conformance with the provisions in Section 84, "Traffic Stripes and Pavement Markings," of the Standard Specifications and these special provisions.

At the option of the Contractor, permanent striping tape conforming to the provisions in "Approved Traffic Products" of these special provisions, may be placed instead of the painted traffic stripes specified herein, except that 3M, "Stamark" Series A320 Bisymmetric Grade, manufactured by the 3M Company, shall not be used. Pavement tape, if used, shall be installed in conformance with the manufacturer's specifications. If pavement tape is placed instead of painted traffic stripes, the pavement tape will be measured and paid for by the meter as paint traffic stripe of the number of coats designated in the Engineer's Estimate.

10-1.34 PAVEMENT MARKERS

Pavement markers shall be placed in conformance with the provisions in Section 85, "Pavement Markers," of the Standard Specifications and these special provisions.

Attention is directed to "Traffic Control System For Lane Closure" of these special provisions regarding the use of moving lane closures during placement of pavement markers with bituminous adhesive.

SECTION 10-2. HIGHWAY PLANTING AND IRRIGATION SYSTEMS

10-2.01 GENERAL

The work performed in connection with highway planting and irrigation systems shall conform to the provisions in Section 20, "Erosion Control and Highway Planting," of the Standard Specifications and these special provisions.

The Contractor shall notify the Engineer not less than 72 hours prior to requiring initial access to the existing irrigation controllers. When the Engineer determines that access to the controllers is required at other times, arrangements will be made to provide this access.

COST BREAK-DOWN

The Contractor shall furnish the Engineer a cost break-down for the contract lump sum items of highway planting and irrigation system.

Cost break-downs shall be completed and furnished in the format shown in the samples of the cost break-downs included in this section. Unit descriptions of work shown in the samples are the minimum to be submitted. Additional unit descriptions of work may be designated by the Contractor. If the Contractor elects to designate additional unit descriptions of work, the quantity, value and amount for those units shall be completed in the same manner as for the unit descriptions shown in the samples. The units and quantities given in the samples are to show the manner of preparing the cost break-downs to be furnished by the Contractor.

The Contractor shall determine the quantities required to complete the work shown on the plans. The quantities and their values shall be included in the cost break-downs submitted to the Engineer for approval. The Contractor shall be responsible for the accuracy of the quantities and values used in the cost break-downs submitted for approval.

No adjustment in compensation will be made in the contract lump sum prices paid for highway planting and irrigation system due to differences between the quantities shown in the cost break-downs furnished by the Contractor and the quantities required to complete the work as shown on the plans and as specified in these special provisions.

The sum of the amounts for the units of work listed in each cost break-down for highway planting and irrigation system work shall be equal to the contract lump sum price bid for the work. Overhead and profit shall be included in each individual unit listed in each cost break-down. Cost break-downs shall be submitted to the Engineer for approval within 15 working days after the contract has been approved. Cost break-downs shall be approved, in writing, by the Engineer before a partial payment for the items of highway planting and irrigation system will be made.

Approved cost break-downs will be used to determine partial payments during the progress of the work and as the basis of calculating the adjustment in compensation for the items of highway planting and irrigation system due to changes ordered by the Engineer. When an ordered change increases or decreases the quantities of an approved cost break-down, the adjustment in compensation will be determined in the same manner specified for increases and decreases in the quantity of a contract item of work in conformance with the provisions in Section 4-1.03B, "Increased or Decreased Quantities," of the Standard Specifications.

HIGHWAY PLANTING COST BREAK-DOWN

Contract No. 11-064614

UNIT DESCRIPTION	UNIT	APPROXIMATE QUANTITY	VALUE	AMOUNT
ROADSIDE CLEARING	LS	LUMP SUM		
PLANT GROUP B	EA	42		
PLANT GROUP F	EA	85 268		
PLANT GROUP H	EA	23 3125		
PLANT GROUP K	EA	10		
PLANT GROUP U	EA	25		
MULCH	M3	240		
COMMERCIAL FERTILIZER (SLOW RELEASE)	KG	1000		
COMMERCIAL FERTILIZER (TABLETS)	TAB	300		
IRON SULFATE	KG	450		

TOTAL _____

IRRIGATION SYSTEM COST BREAK-DOWN

Contract No. 11-064614

UNIT DESCRIPTION	UNIT	APPROXIMATE QUANTITY	VALUE	AMOUNT
CHECK, TEST, REMOVE AND SALVAGE IRRIGATION SYSTEMS	LS	LUMP SUM		
CONTROL AND NEUTRAL CONDUCTORS	LS	LUMP SUM		
25 MM ELECTRIC REMOTE CONTROL VALVE	EA	10		
40 MM ELECTRIC REMOTE CONTROL VALVE	EA	40		
50 MM ELECTRIC REMOTE CONTROL VALVE	EA	1		
12 STATION IRRIGATION CONTROLLER (WALL MOUNT)	EA	1		
25 MM PLASTIC PIPE (PR 200) (SUPPLY LINE)	M	3300		
32 MM PLASTIC PIPE (PR 200) (SUPPLY LINE)	M	1405		
40 MM PLASTIC PIPE (PR 200) (SUPPLY LINE)	M	435		
50 MM PLASTIC PIPE (PR 200) (SUPPLY LINE)	M	855		
65 MM PLASTIC PIPE (PR 200) (SUPPLY LINE)	M	60		
75 MM PLASTIC PIPE (PR 200) (SUPPLY LINE)	M	540		
75 MM PLASTIC PIPE (PR 315) (SUPPLY LINE)	M	8		
50 MM GALVANIZED STEEL PIPE	M	25		
SPRINKLER (TYPE A-5)	EA	23		
SPRINKLER (TYPE A-6)	EA	169		
SPRINKLER (TYPE A-7)	EA	122		
SPRINKLER (TYPE A-8)	EA	33		
SPRINKLER (TYPE A-11)	EA	5		
SPRINKLER (TYPE B-2)	EA	23		
SPRINKLER (TYPE C-2)	EA	24		
SPRINKLER (TYPE C-2) (MODIFIED)	EA	84		
32 MM GATE VALVE	EA	1		
40 MM GATE VALVE	EA	3		
50 MM GATE VALVE	EA	7		
75 MM GATE VALVE	EA	17		

TOTAL _____

10-2.02 EXISTING HIGHWAY PLANTING

In addition to the provisions in Section 20 of the Standard Specifications, work performed in connection with existing highway planting shall be in conformance with the provisions in Section 15, "Existing Highway Facilities," of the Standard Specifications and these special provisions.

Replacement planting shall conform to the requirements specified under "Preservation of Property" of these special provisions.

MAINTAIN EXISTING PLANTS

Existing plants shall be maintained as directed by the Engineer. Maintaining existing plants will be paid for as extra work as provided in Section 4-1.03D of the Standard Specifications.

REMOVE EXISTING PLANTS FOR TRENCHING

Removing existing plants for trenching shall conform to the provisions in Section 20-5.026, "Remove Existing Plants for Trenching," of the Standard Specifications and these special provisions.

Removing existing plants for trenching work shall consist of removing and replacing ground cover, pruning trees and shrubs within trench locations and disposing of removed ground cover and prunings.

Replacement of removed ground cover within the maximum 1.8-m width, as specified in Section 20-5.026, "Remove Existing Plants for Trenching," of the Standard Specifications, will be required, except for trenches within 1.8-m of fences, curbs, dikes or shoulders.

Trees and shrubs adjacent to dikes, walks, fences, guard railing, and pavement edges may be pruned back 3 m from these facilities to facilitate trenching work. When trenching is to be performed adjacent to other trees and shrubs that cannot be avoided, the trees and shrubs may be pruned upon receipt of prior written approval of the Engineer.

Pruning shall include removal of deadwood, suckers, and broken or bruised branches 25 mm or larger in diameter. Pruning shall conform to the provisions in Section 20-4.055, "Pruning," of the Standard Specifications.

Removed ground cover and pruned materials shall be disposed of outside the highway right of way in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

Shrubs adjacent to dikes, fences, guard railing, and the edge of pavement within the 3-m pruned area designated above, that in the opinion of the Engineer should be removed after pruning, shall be removed and disposed of. Removing and disposing of the shrubs not otherwise provided for will be paid for as extra work as provided in Section 4-1.03D of the Standard Specifications.

PRUNE EXISTING PLANTS

Existing plants, as determined by the Engineer, shall be pruned. Pruning of the existing plants, except as otherwise provided in these special provisions, will be paid for as extra work as provided in Section 4-1.03D of the Standard Specifications.

10-2.03 EXISTING HIGHWAY IRRIGATION FACILITIES

The work performed in connection with the various existing highway irrigation system facilities shall conform to the provisions in Section 15, "Existing Highway Facilities," of the Standard Specifications and these special provisions.

Water shall be maintained in conformance with the provisions in Section 20-5.025, "Maintain Existing Water Supply," of the Standard Specifications.

CHECK AND TEST EXISTING IRRIGATION FACILITIES

Existing irrigation facilities that are to remain or to be relocated, and that are within those areas where clearing and grubbing or earthwork operations are to be performed, shall be checked for missing or damaged components and proper operation prior to performing clearing and grubbing or earthwork operations. Existing irrigation facilities outside of work areas that are affected by the construction work shall also be checked for proper operation.

A written list of existing irrigation system deficiencies shall be submitted to the Engineer within 5 working days after checking the existing facilities.

Deficiencies found during checking of the existing facilities shall be corrected as directed by the Engineer. Corrective work ordered by the Engineer will be paid for as extra work as provided in Section 4-1.03D of the Standard Specifications.

When existing irrigation facilities are checked, existing backflow preventers to remain shall be tested for proper operation in conformance with the provisions in Section 20-5.03J, "Check and Test Backflow Preventers," of the Standard Specifications.

Existing backflow preventers shall be retested one year after the satisfactory completion of the previous test or 10 days prior to completion of the plant establishment period, whichever occurs first.

Length of watering cycles for use of potable water from water meters for checking or testing existing irrigation facilities shall be as determined by the Engineer.

Repairs to the existing irrigation facilities ordered by the Engineer after checking and testing the facilities, and further repairs required thereafter as ordered by the Engineer, except as otherwise provided under "Existing Highway Irrigation Facilities" of these special provisions, will be paid for as extra work as provided in Section 4-1.03D of the Standard Specifications.

REMOVE EXISTING IRRIGATION FACILITIES

Existing irrigation facilities to be removed, shall be removed and disposed of. Facilities that are more than 150 mm below finished grade may be abandoned in place. Removed facilities shall be disposed of outside the highway right of way in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

Immediately after disconnecting an existing irrigation facility to be removed or abandoned from an existing facility to remain, the remaining facility shall be capped or plugged, or shall be connected to a new or existing irrigation facility.

SALVAGE EXISTING IRRIGATION FACILITIES

Existing irrigation controllers, sprinklers, valves and valve boxes, where shown on the plans to be removed, shall be salvaged.

The Engineer shall be given written notification of the intent to salvage existing irrigation facilities a minimum of 72 hours prior to salvaging these facilities.

Salvaged irrigation facilities shall remain the property of the State and shall be delivered to the Engineer.

A list of salvaged facilities, including the quantity and size of each item salvaged, shall be included with each delivery.

10-2.04 HIGHWAY PLANTING

The work performed in connection with highway planting shall conform to the provisions in Section 20-4, "Highway Planting," of the Standard Specifications and these special provisions.

HIGHWAY PLANTING MATERIALS

Mulch

Mulch shall be wood chips.

Commercial Fertilizer

Commercial fertilizer (slow release) shall be a pelleted or granular form, shall be slow release, and shall fall within the following guaranteed chemical analysis range:

Ingredient	Percentage Range
Nitrogen	19
Phosphoric Acid	6
Water Soluble Potash	12

Commercial fertilizer (tablet) shall be slow release and shall be in tablet form. Each tablet, as shown in the Plant List of the plans, shall have a mass of $21 \text{ g} \pm 1 \text{ g}$, and shall have the following guaranteed chemical analysis:

Ingredient	Percentage
Nitrogen	20
Phosphoric Acid	10
Water Soluble Potash	5

At the option of the Contractor, two 10.5 g tablets may be used in place of each 21 g tablet designated on the plans or specified in these special provisions. Regardless of the tablet size used, each tablet shall be the slow release type and shall have the same guaranteed chemical analysis as specified for the 21 g tablets. Each 10.5 g tablet shall have a mass of $10.5 \text{ g} \pm 0.5 \text{ g}$.

ROADSIDE CLEARING

Prior to preparing planting areas or commencing irrigation trenching operations for planting areas, trash and debris shall be removed from these areas and a distance of 3 m beyond the edges of those areas. At locations where proposed planting areas are 3.6 m or more from the edges of dikes, curbs, sidewalks, fences, walls, paved shoulders and existing planting to remain or to be maintained, the clearing limit shall be 2 m beyond the outer limits of the proposed planting area.

In addition to removing trash and debris, the project area shall be cleared as specified herein:

- A. Weeds shall be killed and removed from within proposed ground cover areas and within the area extending beyond the outer limits of the proposed ground cover areas to the adjacent edges of shoulders, dikes, curbs, sidewalks, walls, existing planting and fences. At those locations where proposed ground cover areas are 3.6 m or more from the adjacent edges of shoulders, dikes, curbs, sidewalks, walls, and fences, the clearing limit shall be 2 m beyond the outer limits of the proposed ground cover areas.
- B. Weeds shall be killed and removed within proposed mulch areas and within the area extending beyond the outer limits of the proposed mulch areas to the adjacent edges of shoulders, dikes, curbs, sidewalks, walls, existing planting and fences. At those locations where proposed mulch areas are 3.6 m or more from the adjacent edges of shoulders, dikes, curbs, sidewalks, walls, and fences, the clearing limit shall be 2 m beyond the outer limits of the proposed mulch areas.
- C. Weeds shall be killed and removed within planting areas where plants are to be planted in groups or rows 4.6 m or less apart and from within an area extending 2 m beyond the outer limits of the groups or rows of plants.
- D. Weeds shall be killed and removed within an area 2 m in diameter centered at each plant location where the plants are to be planted more than 4.6 m apart and are located outside of ground cover areas.

After the initial roadside clearing is complete, additional roadside clearing work shall be performed as necessary to maintain the areas, as specified above, in a neat appearance until the start of the plant establishment period. This work shall include the following:

- A. Trash and debris shall be removed.
- B. Rodents shall be controlled.
- C. Weed growth shall be killed before the weeds reach the seed stage of growth or exceed 150 mm in length.
- D. Existing ground cover shall be killed and removed from within the 2-m diameter areas specified for each proposed plant location within the existing ground cover areas.
- E. Weeds in plant basins, including basin walls, shall be removed by hand pulling, after the plants have been planted.

Weed Control

Weed control shall also conform to the following:

- A. Stolon type weeds shall be killed with glyphosate.
- B. Tumbleweeds shall be removed by hand pulling before the tumbleweeds reach a height of 150 mm.
- C. Removed weeds and ground cover shall be disposed of outside the highway right of way in conformance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

Roadside clearing work shall not include work required to be performed as clearing and grubbing as specified in Section 16, "Clearing and Grubbing," of the Standard Specifications.

PESTICIDES

Pesticides used to control weeds shall conform to the provisions in Section 20-4.026, "Pesticides," of the Standard Specifications. Except as otherwise provided in these special provisions, pesticide use shall be limited to the following materials:

Diquat
Glyphosate
Oxadiazon - 50 percent WP (Preemergent)
Oryzalin (Preemergent)
Trifluralin (Preemergent)
Ammonium Sulfate

Granular forms of pesticides shall be one of the following materials and shall be applied to areas that will be covered with mulch:

Dichlobenil (Preemergent)
Oxadiazon (Preemergent)

Granular preemergents shall be applied prior to the application of mulch. Mulch applications shall be completed in these areas on the same working day. Photosensitive dye will not be required.

Glyphosate shall be used to kill stolon type weeds.

Oxadiazon shall be of the emulsifiable concentration or wettable powder type, except when Oxadiazon is used under mulch in conformance with these special provisions.

Prior to the application of preemergents, ground cover plants shall have been planted a minimum of 3 days and shall have been thoroughly watered.

A minimum of 100 days shall elapse between applications of preemergents.

Except for ground cover plants, preemergents shall not be applied within 450 mm of plants.

Ammonium sulfate shall be used only in areas planted to *Carpobrotus* or *Delosperma*. Ammonium sulfate shall not be applied in a manner that allows the pesticides to come in contact with trees or shrubs.

If the Contractor elects to request the use of other pesticides on this project, the request shall be submitted, in writing, to the Engineer not less than 10 working days prior to the intended use of the other pesticides. Except for the pesticides listed in these special provisions, no pesticides shall be used or applied without prior written approval of the Engineer.

Pesticides shall not be applied within the limits of the plant basins. Pesticides shall not be applied in a manner that allows the pesticides to come in contact with the foliage and woody parts of the plants.

PLANTING

Commercial fertilizer and iron sulfate shall be applied or placed at the time of planting and at the rates shown on the plans.

A granular preemergent shall be applied to areas to be covered with mulch outside of plant basins in conformance with the provisions in "Pesticides" of these special provisions.

Mulch placed in areas outside of plant basins shall be spread to a depth of not less than 75 mm.

Mulch shall not be placed within one meter of the edge of earthen drainage ditches, within one meter of the edge of paved ditches, and within one meter of the edge of drainage flow lines.

Attention is directed to "Irrigation Systems Functional Test" of these special provisions regarding functional tests of the irrigation systems. Planting shall not be performed in an area until the functional test has been completed for the irrigation system serving that area.

PLANT ESTABLISHMENT WORK

The plant establishment period shall be Type 2 and shall be not less than 120 working days.

Attention is directed to "Relief From Maintenance and Responsibility" in these special provisions regarding relief from maintenance and protection.

Commercial fertilizer (slow release) shall be applied to trees, shrubs, vines and ground cover during the first week of March and October of each year. Commercial fertilizer shall be applied at the rates shown on the plans and shall be spread with a mechanical spreader wherever possible.

During the plant establishment period, the plants shall be watered utilizing the automatic irrigation control system. A watering schedule shall be submitted to the Engineer for use during the plant establishment period.

Weeds within plant basins, including basin walls, shall be controlled by hand pulling.

Weeds within mulched and ground cover areas and outside of plant basins shall be controlled by killing.

Weeds outside of mulched areas, plant basins, ground cover, the median, and paved areas shall be controlled by mowing. At locations where proposed planting areas are 3.6 m or more from the edges of existing plantings to remain and from shoulders, dikes, curbs, sidewalks, fences, and walls, the mowing limit shall be 2 m beyond the outer limits of the proposed planting area.

At the option of the Contractor, plants of a larger container size than those originally specified may be used for replacement plants during the plant establishment period. The use of plants of a larger container size than those originally specified for replacement plants shall be at the Contractor's expense.

When ordered by the Engineer, one application of a preemergent pesticide conforming to the provisions in "Pesticides" of these special provisions, shall be applied between 20 and 30 working days prior to completion of the plant establishment period.

The final inspection shall be performed in conformance with the provisions in Section 5-1.13, "Final Inspection," of the Standard Specifications and shall be completed a minimum of 20 working days before the estimated completion of the contract.

10-2.05 IRRIGATION SYSTEMS

Irrigation systems shall be furnished and installed in conformance with the provisions in Section 20-5, "Irrigation Systems," of the Standard Specifications, except materials containing asbestos fibers shall not be used.

Pipe supply lines shall be pressure tested in conformance with the provisions in Section 20-5.03H, "Pressure Testing," of the Standard Specifications, except the pipe (supply line) on the discharge side of the control valve shall be tested by Method B as specified in Section 20-5.03H(2), "Method B," of the Standard Specifications.

Gate valves, 75 mm and larger in size, shall be furnished with a square lug and shall be operated by use of long shank keys. Prior to acceptance of the contract, 3 long shank keys shall be delivered to the Engineer.

Gate valves 75 mm and larger in size shall be flanged type gate valves and shall have a solid brass wedge.

Pipe flanges used to connect plastic or metal pipe to gate valves shall be metal. Plastic flanges will not be allowed.

VALVE BOXES

Valve boxes shall conform to the provisions in Section 20-2.24, "Valve Boxes," of the Standard Specifications, except as otherwise provided herein.

Valve boxes shall be precast portland cement concrete, fiberglass or reinforced plastic.

Covers for concrete valve boxes shall be glass fiber reinforced plastic.

Covers for plastic valve boxes shall be glass fiber reinforced plastic or plastic.

Valve boxes shall be identified on the top surface of the covers by branding the appropriate abbreviations for the irrigation facilities contained in the valve boxes as shown on the plans. Valve boxes that contain remote control valves shall be identified by the appropriate letters and numbers (controller and station numbers). The letters and numbers shall be 50 mm in height.

ELECTRIC AUTOMATIC IRRIGATION COMPONENTS

Irrigation Controllers

Irrigation controllers shall be single, solid-state independent controllers conforming to the following:

- A. Irrigation controllers shall be fully automatic and shall operate a complete 14-day or longer irrigation program.
- B. A switch or switches shall be provided on the face of the control panel that will turn the irrigation controller "on" or "off" and provide for automatic or manual operation. Manual operation shall allow cycle start at the desired station and shall allow activation of a single station.
- C. The watering time of each station shall be displayed on the face of the control panel.
- D. The irrigation controller and the low voltage output source shall be protected by fuses or circuit breakers.
- E. The irrigation controller mechanism, panel and circuit board shall be connected to the low voltage control and neutral conductors by means of plug and receptacle connectors located in the irrigation controller enclosure.
- F. Each station shall have a variable or incremental timing adjustment with a range of 120 minutes to a minimum of one minute.
- G. Irrigation controllers shall be capable of a minimum of 4 program schedules.
- H. Irrigation controllers shall have an output that can energize a pump start circuit or a remote control valve (master).
- I. Irrigation controllers shall be manufactured by the same company.
- J. Where direct burial conductors are to be connected to the terminals strip, the conductors shall be connected with the proper size open-end crimp-on wire terminals. No exposed wire shall extend beyond the crimp of the terminal and the wires shall be parallel on the terminal strip.
- K. Irrigation controllers shall provide for adjustments from 0 to 300 percent, in one percent increments, for water budgeting.

Electric Remote Control Valves

Electric remote control valves shall conform to the provisions in Section 20-2.23, "Control Valves," of the Standard Specifications and the following:

- A. Valves shall be glass filled nylon, brass or bronze construction.
- B. Valves shall be angle pattern (bottom inlet) or straight pattern (side inlet) as shown on the plans.

Pull Boxes

Pull box installations shall conform to the provisions in Section 20-5.027I, "Conductors, Electrical Conduits and Pull Boxes," of the Standard Specifications.

Conductors

Low voltage, as used in this section "Conductors," shall mean 36 V or less.

Low voltage control and neutral conductors in pull boxes and valve boxes, at irrigation controller terminals, and at splices shall be marked with adhesive cloth wrap-around markers.

Markers for the control conductors shall be identified with the appropriate number or letter designations of irrigation controllers and station numbers. Markers for neutral conductors shall be identified with the appropriate number or letter designations of the irrigation controllers.

New control and neutral conductors that are to replace existing control and neutral conductors shall be the same size and color as the existing control and neutral conductors being connected to.

The color of low voltage neutral and control conductor insulation, except for the striped portions, shall be homogeneous throughout the entire thickness of the insulation.

Insulation for conductors may be UL listed polyethylene conforming to UL44 test standards with a minimum insulation thickness of 1.05 mm for wire sizes 10AWG and smaller.

Prior to granting relief from maintenance and responsibility, as provided in these special provisions, the functional test, in conformance with the provisions in Section 20-5.027J, "Testing," of the Standard Specifications, shall be satisfactorily completed, and instruction shall be given to the Engineer on the use and adjustment of the installed irrigation controllers.

IRRIGATION SYSTEMS FUNCTIONAL TEST

Functional tests for the irrigation controllers and associated automatic irrigation systems shall conform to the provisions in Section 20-5.027J, "Testing," of the Standard Specifications and these special provisions.

Tests shall demonstrate to the Engineer, through one complete cycle of the irrigation controllers in the automatic mode, that the associated automatic components of the irrigation systems operate properly. If automatic components of the irrigation systems fail a functional test, these components shall be repaired at the Contractor's expense and the testing repeated until satisfactory operation is obtained.

Associated automatic components shall include, but not be limited to, remote control valves.

Upon completion of work on an irrigation system, including correction of deficiencies and satisfactory functional tests for the systems involved, the plants to be planted in the area watered by the irrigation system may be planted provided the planting areas have been prepared as specified in these special provisions.

PIPE

Plastic Pipe

Plastic pipe supply lines shall be polyvinyl chloride (PVC) 1120 or 1220 pressure rated pipe with the minimum pressure rating (PR) shown on the plans.

Plastic pipe supply lines and fittings that are 75 mm or larger in diameter on the supply side of control valves shall be the rubber ring gasket type, except when pressure rating (PR) 315 plastic pipe supply line is required.

Plastic pipe supply lines less than 75 mm in diameter shall have solvent cemented type joints. Primers shall be used on the solvent cemented type joints.

Plastic pipe supply lines (main) shall have a minimum cover of 0.45 m.

Fittings for plastic pipe supply lines with a pressure rating (PR) of 315 shall be Schedule 80.

SPRINKLERS

Sprinklers shall conform to the type, pattern, material, and operating characteristics listed in the "Sprinkler Schedule" shown on the plans.

Drain pipe for Type C-2 modified sprinklers shall be commercially available rigid perforated polyvinyl chloride (PVC) pipe with the holes spaced not more than 150 mm on center on one side of the pipe.

The drain pipe shall be installed around the sprinkler nipple within the plant basin as shown on the plans with the holes facing the plant root ball.

Pea gravel for backfilling the drain pipe shall be naturally rounded aggregate, clean, washed, dry and free from clay or organic material. The pea gravel shall conform to the following grading:

Sieve or Screen Size	Percentage passing
19 mm	100
12.5 mm	90-100
9.5 mm	40-70
4.75 mm	0-15
2.36 mm	0-3

SECTION 10-3. ELECTRICAL SYSTEMS

10-3.01 DESCRIPTION

Fiber optic communication system shall conform to the provisions in Section 86, "Signals, Lighting and Electrical Systems," of the Standard Specifications and these special provisions.

Communication conduit is included in the following structures:

South Chollas Creek Bridge, Bridge No. 57-0436
Rigel Street Undercrossing, Bridge No. 57-0437
Route 5/15 Separation, Bridge No. 57-0438
Chollas Creek Bridge, Bridge No. 57-0473
Las Chollas Bridge, Bridge No. 57-0323K
28th Street Undercrossing, Bridge No. 57-0359
32nd Street Undercrossing, Bridge No. 57-0361
Las Chollas Creek Bridge, Bridge No. 57-0107L
Las Chollas Creek Bridge, Bridge No. 57-495S
Coronado Bridge No. 57-0857.

10-3.02 COST BREAK-DOWN

Cost break-downs shall conform to the provisions in Section 86-1.03, "Cost Break-Down," of the Standard Specifications and these special provisions.

The Engineer shall be furnished a cost break-down for each contract lump sum item of work described in this Section 10-3.

The cost break-down shall be submitted to the Engineer for approval within 5 days after the contract has been approved. The cost break-down shall be approved, in writing, by the Engineer before any partial payment for the items of electrical work will be made.

The cost breakdown shall include the following items in addition to those listed in the Standard Specifications:

A. Training

10-3.03 MAINTAINING EXISTING AND TEMPORARY ELECTRICAL SYSTEMS

Traffic signal system shutdowns shall be limited to periods allowed for lane closures listed or specified in "Maintaining Traffic" of these special provisions.

Ramp metering system shutdowns for westbound SR94 entrance ramp shall be limited to periods between the hours of 10:00 a.m. and 5:00 a.m. the following morning.

Ramp metering system shutdowns for eastbound SR94 entrance ramp shall be limited to periods between the hours of 7:00 p.m. and 5:00 p.m. the following afternoon.

10-3.04 FOUNDATIONS

Where cast-in-drilled-hole concrete pile foundations are to be constructed in slag aggregate embankments, the diameter of the pile shall be increased to provide a minimum of 75 mm of concrete cover over the reinforcing steel.

Full compensation for the increased diameter of cast-in-drilled-hole concrete pile foundations in slag aggregate embankments, including additional portland cement concrete, and increased drilling and placement costs shall be considered as included in the contract lump sum price paid for the item requiring the cast-in-drilled-hole concrete pile foundation and no additional compensation will be allowed therefor.

10-3.05 ROTOR DRILLING

GENERAL.--This work shall consist of rotor drilling a 63 mm diameter holes at 45 degrees through existing cabinet foundations in accordance with the details shown on the plans, these special provisions, as directed by the Engineer.

EXECUTION.--Holes shall be rotor drilled by methods that will not shatter or damage the concrete adjacent to the holes.

Water for the rotor drilling operations shall be from the domestic water supply and shall not contain more than 1000 parts per million of chlorides as Cl, nor more than 1300 parts per million of sulfates as SO₄, nor shall it contain any impurities in a sufficient amount to cause discoloration or etching of the surface.

Water from the rotor drilling operations shall not be permitted to flow into sewers or other drainage facilities.

10-3.06 CONDUIT

Conduit to be installed underground shall be Type 3 unless otherwise specified.

Pull ropes for empty conduits for future use shall be a soft fiber type of not less than 12 mm diameter.

The conduit in a foundation and between a foundation and the nearest pull box shall be Type 3.

Conduit sizes shown on the plans and specified in the Standard Specifications and these special provisions are referenced to metallic type conduit. When rigid non-metallic conduit is required or allowed, the nominal equivalent industry size shall be used as shown in the following table:

Size Designation for Metallic Type Conduit	Equivalent Size for Rigid Non-metallic Conduit
21	20
27	25
41	40
53	50
63	65
78	75
103	100

The installation of conduit may involve locations where existing irrigation crossovers may be encountered. A list of these locations is available from the Engineer.

Excavation performed within 2 m of the irrigation crossover, at a depth greater than 0.6 m, shall be by hand digging with hand tools.

The Contractor shall notify the Engineer at least 2 working days prior to excavating within 2 m of the irrigation crossover.

When Type 3 conduit is placed in a trench (not in pavement or under portland cement concrete sidewalk), after the bedding material is placed and the conduit is installed, the trench shall be backfilled with commercial quality concrete, containing not less than 250 kg of portland cement per cubic meter, to not less than 100 mm above the conduit before additional backfill material is placed.

Multiduct conduit system (MDCS) trench and backfill requirements shall be as shown on the plans and as described elsewhere in these special provisions.

After conductors have been installed, the ends of conduits terminating in pull boxes, service equipment and other enclosures, in hub cabinets, and in controller cabinets shall be sealed with an approved type of sealing compound.

All conduits shall be cleaned with a mandrel or cylindrical soft bristled brush and blown out with compressed air until all foreign material is removed immediately prior to sealing empty conduits or installing cables. Cleaning shall be performed in the presence of the Engineer. The ends of conduits shall be sealed with an approved sealing compound. The ends of multiduct conduit system shall be sealed with sealing plugs as described elsewhere in these special provisions.

Conduits shall be supported on cradles fabricated from concrete or steel. Other materials may be used for cradles as approved by Caltrans. Timber supports shall not be used. Support shall be firmly anchored to the structure.

Supports shall fit loosely around conduits to allow for thermal movement.

Shear plate shall not be required when Schedule 40 steel conduit is used.

Innerduct shown on the plans for use in bridge structures shall be black, smooth wall polyethylene conduit meeting ASTM D-2239 or ASTM D-2513 Specifications and shall conform to these special provisions.

For Size 27 innerduct, the minimum inside diameter shall be not less than 26.6 mm, the maximum outside diameter not greater than 34.3 mm, and the minimum wall thickness not less than 2.3 mm. The nominal tensile strength shall be not less than 13 500 kPa and the maximum pull load not less than 300 kg nominal. The minimum bending radius shall be not greater than 300 mm nominal.

Innerduct shall have printed sequential measurement markings (at least every yard or meter).

Innerduct shall be installed in continuous lengths (without the use of mechanical couplers or fusion splices) of not less than 1500 m. Lengths of innerduct less than 1500 m may only be used between a fusion splice or mechanical coupler and termination at a junction box, cabinet, or other similar enclosure, or between junction boxes, cabinets, or other similar enclosures. The location of mechanical couplers or fusion splices shall be as directed by the Engineer.

Mechanical couplers or fusion splices shall be as recommended by the innerduct manufacturer.

10-3.07 MULTIDUCT CONDUIT SYSTEM

Where multiduct conduit system (MDCS) is shown on the plans a factory assembled conduit system shall be used. The system shall be :

A Size 103 conduit with four Size 25 (I.D. nominal) conduits contained therein. Joints shall be keyed to mate the enclosed conduits.

Conduit to be installed underground shall be Type 3 unless otherwise specified. Conduit on bridge structures shall be fiberglass unless otherwise shown on the plans, except that the conduit contained within size 103 conduits maybe Type 3.

The quantity of Size 25 conduits shall be as shown on the plans.

Conduits contained within size 103 shall be either all individually factory color coded or all orange, except that fiberglass conduits shall be gray. Straight segments of multiduct conduit shall be nominal 6 m lengths.

Joints shall be solvent welded or sealed with a gasket as recommended by the manufacturer. Joints shall lock together or be provided with a seating mark to verify proper assembly.

Bends shall be rigid factory assembled sections designed to fit the system.

The minimum conduit bend radius shall not be less than 1.8 m.

10-3.08 FIBERGLASS CONDUIT

At locations where conduit is to be installed on bridge structures, fiberglass conduit for multiduct conduit system as shown on the plans shall be used unless otherwise specified. Fiberglass conduit shall conform to the following specifications.

GENERAL.--Fiberglass conduit and components shall comply with the specifications in ANSI/NEMA Standards Publication TC-14A or TC-14B. All fiberglass conduit components shall be free of defects including delaminations, foreign inclusions, etc. All fiberglass conduit components shall be nominally uniform (as commercially practical) in color, density, and physical properties. Fiberglass conduit shall be straight and the ends shall be cut square and true. The contractor shall purchase all fiberglass conduit and other fiberglass conduit system components from the same manufacturer to insure component to component compatibility.

Fiberglass conduit shall be manufactured in 6 m minimum lengths.

SYSTEM COMPONENTS.--Fiberglass conduit components shall include compatible fittings, adapters, expansion joints, and factory bends at nominal radii of 600 mm, 900 mm, 1200 mm and 1800 mm.

MATERIAL.--All fiberglass conduit system components shall be produced from heat cured, corrosion resistant epoxy resin and continuous fiberglass rovings. All materials shall be manufactured for use at temperatures from -40°C to 110°C. All fiberglass conduit components shall be manufactured using a homogeneously dispersed UV inhibitor. When exposed to direct diurnal sunlight, the UV inhibitor shall prevent the degradation of all physical material properties, except for surface cosmetic appearance. Materials shall contain no halogens above trace levels and shall be fire resistant.

JOINING METHOD.--Joints shall be water tight and withstand a minimum 4450 N of pullout tension.

STIFFNESS.--For all sizes of fiberglass conduit, under a load of 7000 N/m of conduit, the deflection of the inside diameter shall not exceed five percent.

IMPACT RESISTANCE.--The minimum impact resistance values for the fiberglass conduit shall be as follows when measured as described in ASTM D2444-70, using a 9 kg tip "B" with a 50 mm radius nose:

Size 53 conduit	40 N•m
Size 78 conduit	68 N•m
Size 103 conduit	108 N•m

Attention is directed "Conduit" elsewhere in these special provisions.

10-3.09 SEALING PLUG

Except as otherwise noted, multiduct conduit system conduits and other conduit with fiber optic cable shall have their ends sealed with commercial preformed plugs which prevent the passage of gas, dust and water into the multiduct conduit system.

Sealing plugs shall be removable and reusable. Plugs sealing conduit, conductor or cable shall be the split type that permits installation or removal without removing conductors or cables. Sealing plugs shall be capable of withstanding a pressure of 34.5 kPa.

Sealing plugs that seal MDCS shall seal the conduit and all enclosed conduits simultaneously with one self contained assembly having an adjustable resilient filler of neoprene or silicone rubber clamped between backing ends and compressed with stainless steel hardware.

Sealing plugs that seal the Size 25 conduits of MDCS shall seal each conduit individually with appropriate sizes and configuration to accommodate either empty conduit or those containing cable. Suitable sealing between the varying size cables and the plugs shall be provided by inserting split neoprene or silicone adapting sleeves, used singularly or in multiples, within the body of the plugs, or an equivalent method approved by the Engineer.

A sealing plug that seals an empty conduit shall have an eye or other type of capturing device (on the side of the plug that enters the conduit) to attach onto the pull tape so the pull tape will be easily accessible when the plug is removed.

10-3.10 TRACER WIRE

Tracer wire shall be provided and placed in the trench over conduits containing fiber optic cable. The wire shall be placed 50 mm above the uppermost conduit in the trench or secured to the top of the uppermost conduit in the trench.

Tracer wire shall be No. 8 stranded, minimum, copper conductor with Type TW, THW, RHW, or USE insulation. The tracer wire shall form a mechanically and electrically continuous line throughout the length of the trench. A minimum of 1.5 m of slack shall be extended into each pull box and fiber optic vault from each direction. The wires shall be carefully placed so as not to be damaged by backfilling operations.

Conduit entering or exiting a reinforced concrete structure will not require tracer wire to the first pull box or vault.

Tracer wire may be spliced at intervals of not less than 150 m.

10-3.11 WARNING TAPE

Warning tape shall be provided and placed in the trench over conduits as shown on the plans. The warning tape shall be 100 mm wide with bold printed black letters of approximately 19 mm on bright orange color background, and contain the printed warning "CAUTION CALTRANS FIBER OPTIC LINE BURIED BELOW", repeated at approximately 800 mm intervals.

The printed warning shall be non-erasable and shall be rated to last with the tape for a minimum of 40 years.

The construction of the warning tape shall be such that it will not delaminate when it is wet. It shall be resistant to insects, acid, alkaline and other corrosive elements in the soil. It shall have a minimum of 712 N tensile strength per 150 mm wide strip and shall have a minimum of 700 percent elongation before breakage.

10-3.12 SLURRY CEMENT BACKFILL

The slurry cement backfill for the installation of multiduct conduit system or other conduit as shown on the plans shall conform to the provisions in Section 19, "Earthwork," of the Standard Specifications and these special provisions.

The size of the aggregate shall not be larger than 9.5 mm.

The concrete shall be pigmented a medium to dark, red or orange color by the addition of commercial quality cement pigment to the concrete mix. The red or orange concrete pigment shall be LM Scofield Company; Orange Chromix Colorant; Davis Colors; or equal.

Full compensation for furnishing and incorporating the cement pigment to achieve the color required shall be considered as included in the contract price or prices paid per meter for the conduit involved and no separate payment will be made therefor.

10-3.13 DIRECTIONAL BORING METHOD

Where jacking and drilling is shown on the plans as the required installation method, conduits may be installed by the directional boring method. Directional boring shall not be used at other locations unless approved by the Engineer. All pull boxes or vaults shall be located at the locations shown on the plans.

Minimum depth of conduit below finished grade in pavement areas shall be 2.5 m.

A listing of materials (composition and strength) and methods used in directional boring shall be submitted for the Engineer's review.

The diameter of the boring tool shall not exceed 260 mm measured across the boring path. Mineral slurry or wetting solution shall only be used to lubricate the boring tool and to stabilize the soil surrounding the boring path. Mineral slurry or wetting solution shall be water based and environmentally safe.

Residue from directional boring operations shall be handled in the same manner as residue from slot cutting operations described in Section 86-5.01A(5), "Installation Details," of the Standard Specifications.

The directional boring equipment shall have directional control of the boring tool and have an electronic boring tool location detection system. During operation, the directional boring equipment shall be able to determine the location of the tool both horizontally and vertically.

Slurry cement backfill and warning tape, as shown on the plans for trench installations of conduit, are not required where the directional boring method is used. Tracer wire shall be attached to the uppermost conduit prior to conduit installation.

A representative of the Contractor must be in direct charge and control of the directional boring operation at all times.

The Engineer shall be notified 2 working days in advance of starting directional boring operations. Directional boring shall only be performed in the presence of the Engineer unless otherwise notified in writing by the Engineer.

Full compensation for directional boring shall be considered as included in the contract unit price paid for the conduit involved and no additional compensation will be allowed therefor.

10-3.14 JUNCTION BOXES

Junction box shown mounted on bridge structures shall be fiberglass.

10-3.15 PULL BOXES

Grout shall not be placed in bottom of pull boxes.

Where the sump of an existing pull box is disturbed by the Contractor's operation, the sump shall be reconstructed as shown on Standard Plan ES-8.

10-3.16 FIBER OPTIC VAULT

Fiber optic vaults shall conform to the Western Underground Committee Guide No. 3.6, "Nonconcrete Enclosures," except where noted in these special provisions, and shown on the plans.

Covers shall be the non-skid type. Cover marking shall be "CALTRANS FIBER OPTICS" on each cover. Each cover shall have inset lifting pull slots. Cover hold down bolts or cap screws and nuts shall be of brass, stainless steel, or other non-corroding metal material.

A reinforced concrete encasement ring shall be poured around the collar of the fiber optic vault as shown on the plans. The concrete for encasement ring shall contain not less than 325 kg of cement per cubic meter.

Fiber optic vaults and covers shall be rated for AASHTO HS 20-44 loads and be installed as detailed and where shown on the plans.

Hangers shall be made of a non-corroding material and be free of any sharp edges. A separate hanger shall be provided for a minimum of eight fiber optic cables and be securely fastened to the side wall with the slack fiber optic cable neatly coiled.

The Contractor shall not install additional fiber optic vaults over those shown on the plans without the Engineer's written approval.

10-3.17 HUB CABINET

The hub cabinet consists of a prefabricated aboveground aluminum structure with an in-ground concrete basement conforming with the details shown on the plans and as specified in these special provisions or as directed by the Engineer. The structure shall be pre-manufactured by a company normally engaged in the fabrication of controlled environmental structures. Nominal 3-mm thick sheeting shall be used for the aluminum structure. The hub cabinet shall be rated at not less than Nema 3R.

The hub cabinet shall include the following equipment:

Single phase, 3-wire circuit main breaker panel board equipped with provisions for 6 circuit breakers.

Interior lighting consisting of ceiling-mounted fixtures (containing two 1.2 meter, 40 W fluorescent lamps) at the approximate locations shown on the plans and shall conform to the following specifications:

Contain a motion detector sensor. In addition to a test switch, the motion detector circuit shall have an override switch for manual operation.

Fully automatic operation, motion is detected and shall continue to operate for 10 minutes minimum after no motion is detected.

Emergency lighting shall consist of a 2-bulb, battery operated light and shall conform to the following specifications:

- Completely self-contained with an external test switch and wired to operate when commercial power fails.
- Able to operate continuously for 2 hours minimum under full charge.
- Contain a maintenance free battery with a 10-year rated life.
- Lamps shall be glare-free sealed beam PAR 36.
- Charger shall be solid state and feature an automatic low voltage disconnect and operate on 120 V_(ac).

A 250 W sump pump with two float switches and drain placed as shown on the plans.

Water level indicator and alarm system.

High Humidity Alarm.

Intrusion Alarm - Local audio shall be a siren rated at 100 dB, 3200 Hz, piezo type with an adjustable delay. The alarm system and components shall be tamper resistant and installed in the hub cabinet. The intrusion alarm sensor shall automatically reset to the active state once the entranceway cover is closed.

High and Low Temperature Alarm.

Commercial Power Alarm (failure).

Smoke Alarm - The smoke detector shall be a photo-electric smoke detector with built-in siren and battery back-up.

Step ladder rated Type 1 and fabricated from aluminum or steel. The ladder shall be secured to the cabinet structure.

Commercial quality EIA 482 mm racks of the quantity, dimension and placement as shown on the plans.

Splice ladders of the dimension and configuration shown on the plans.

Air conditioners, of the quantity shown on the plans, thermostatically controlled to provide a minimum capacity of 12 000 BTU each.

The cabinet shall be equipped to maintain an interior ambient temperature range of 16°C to 24°C.

Interior walls shall be insulated with an R-7 foil type insulation.

Convenience outlets for 120 Volts components are shown on the plans.

An emergency power input connector shall be located on the outside of the structure adjacent to the entranceway. The connector shall be enclosed in a weatherproof housing and shall consist of a 100 A, 3-pole, 4-wire connector rated at 120/240 volts.

The hub structure shall be designed to meet the following structure requirements, in addition to those shown on the plans:

Design Loading: Roof, 2.39 kPa; Floor, 11.97 kPa; Wind, 128 km/h; and Seismic, Zone 4.

EARTHWORK

Earthwork shall conform to the provisions of Section 19, "Earthwork," of the Standard Specifications and these special provisions. If the manufacturer's requirements for installation of the hub cabinet exceeds those provisions of Section 19 of the Standard Specifications, the more rigorous requirements shall apply.

Excess material removed as "Structure Excavation" shall be utilized in embankment construction or disposed of outside the highway right of way in accordance with the provisions in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

ELECTRICAL

All electrical work for the hub cabinet shall conform to the provisions in Section 86, "Signals, Lighting and Electrical Systems," of the Standard Specifications and these special provisions.

The hub cabinet shall be wired for a 100 A, 60 Hz, 3-wire, 120/240-volt single phase service.

The alarm features provided in the hub cabinet shall provide local audio and visual indicators and remotely be connected to an alarm terminal port for connection to the transportation management center, as shown on the plans and described in these special provisions. The following is a list of alarm contact closures (rated at 110 V_(ac), 2A minimum) and conditions for the alarms, that shall be provided showing the status of the hub cabinet:

Water level indicator and alarm system- activated by the float switch on the sump pump.

High Humidity Alarm - activated over an adjustable humidity range, set between 20 to 85 percent.

Intrusion Alarm - activated whenever the entranceway cover is opened.

High and Low Temperature Alarm - activated over an adjustable high temperature range between 26°C to 45°C and an adjustable low temperature range between 0°C to 24°C.

Commercial Power Alarm (failure) - activated whenever commercial power is interrupted for more than 6 cycles.

Smoke Alarm - activated whenever smoke or fire is detected in the hub cabinet.

The contact closures for these alarms shall be connected to a terminal block in the enclosure.

DOOR AND DOOR HARDWARE

Door shall be right-hand or left-hand swing. The door shall have provisions for opening the door from the interior of the cabinet without the use of tools.

Door shall be equipped with weatherstripping, butt hinges, lockset, door stop, and threshold.

Weatherstripping shall be installed on both sides and the top of the door.

Lockset cylinder shall be keyed to match a sample key supplied by the Engineer.

Door and frame shall be installed rigidly, securely, plumb, and true. The door shall operate free without rubbing or binding. Clearance between the frame and door shall be not more than 3-mm.

Hardware items shall be accurately fitted, securely applied, and adjusted in accordance with the manufacturers' instructions.

Hardware items shall be removed from surfaces to be painted during painting.

EXTERIOR

Aboveground exterior surfaces of the hub cabinet shall not be coated.

Below ground exterior surfaces shall be coated with a protective seal suitable for the underground installations according to the following requirements:

All coatings shall be the best quality grade of specified types as regularly manufactured by a recognized coating manufacturer.

Coatings shall be applied only when surfaces are dry and properly prepared and the surrounding conditions are satisfactory for coating. Surfaces shall be cleaned of all dust, dirt, grease, wax, loose coatings, and other substances that would impair bonding of the coating.

10-3.18 CATHODIC PROTECTION

Cathodic protection system components including electrical connections and anodes shall be furnished and installed in accordance with the details shown on the plans and as specified in these special provisions. Cathodic protection equipment shall be suitable for the equipment to be protected and manufactured by a manufacturer who is now regularly engaged in the manufacture of cathodic protection equipment.

LOCATION OF CATHODIC PROTECTION

The locations of cathodic protection equipment, devices, outlets and appurtenances as shown on the plans are approximate only. Exact locations shall be determined by the Contractor subject to the approval of the Engineer.

SUBMITTALS

The Contractor shall submit a list of the cathodic equipment, materials, and installation methods for approval by the Engineer. The submittal shall include, but not be limited to:

Hub enclosure manufacturer's approval of the proposed cathodic protection system.

Engineering drawing showing the proposed cathodic protection layout.

Cathodic protection materials (description and quantity).

Description of the cathodic protection materials (including anode composition and weight).

Cathodic protection installation methods (including weld type and quantity to connect anode leads to equipment).

Cathodic protection system manufacturer's testing methods, list of recommended testing equipment and acceptable range of results for individual components.

Cathodic protection system manufacturer's certification that the components provided are as described in function, composition and performance.

Catalog cut sheets, bulletins, brochures or data sheets shall be submitted for items of material or equipment for which shop drawings are not available. Catalog cut sheets, bulletins, brochures or data sheets are not required to be submitted for miscellaneous items of hardware which are needed to accomplish this work and which are not specifically covered in these specifications.

CAUTION TAPE

Red Caution tape 75-mm in width shall be installed above buried wire and conduits at a maximum depth of 305 mm below grade over the wire and conduit location.

10-3.19 CONDUCTORS AND WIRING

The minimum insulation thickness, at any point, for Type USE, RHH or RHW wire shall be 1.0 mm for conductor sizes No. 14 to No. 10, inclusive, and 1.3 mm for No. 8 to No. 2, inclusive. The minimum insulation thickness, at any point, for Type THW and TW wires shall be 0.69 mm for conductor sizes No. 14 to No. 10, inclusive, 1.02 mm for No. 8, and 1.37 mm for No. 6 to No. 2, inclusive.

Splices shall be insulated with heat-shrink tubing of the appropriate size after thoroughly painting the spliced conductors with electrical insulating coating.

Heat-shrink material shall be heated as recommended by the manufacturer.

In addition to the requirements for splices in detector circuits, the open end of cable jackets or tubing shall be sealed in a manner similar to the splicing requirements to prevent the entrance of water.

10-3.20 AIR BLOWN METHOD

At the Contractor's option, installation of cable into conduit, ducts or subducts may be performed using an "Air Blown Method".

The "Air Blown Method" shall be an installation method that uses a mechanical device combined with a high speed flow of compressed air to place cables into conduits, ducts or subducts.

The "Air Blown Method" shall conform to the following:

The method shall install cable without exceeding the cable manufacturer's tensile and compressive strength ratings.

The mechanical device shall be used to provide a pushing force on the cable into the conduit.

The cable installation equipment shall also have, at minimum, the following features:

Controls to regulate the flow rate of compressed air entering the conduit, duct or subduct, and any hydraulic or pneumatic pressure applied to the cable.

Safety shutoff valves to disable the system in the event of sudden changes in pneumatic or hydraulic pressure.

Measuring device to determine the speed of the cable during installation and the length of the cable installed.

Information on the proposed "Air Blown Method" shall be submitted to the Engineer. The submittal shall include, but not be limited to, the following items:

1. Project description;
2. List or plan sheet marked to identify the conduits and cables involved;
3. Equipment description and specifications;
4. Manufacturer's test data covering the performance of the equipment and cable stress in a typical installation using cable equivalent to cable to be installed on this project; and
5. User/Installer Manual for the equipment and installation procedures.

Within 30 days after the approval of the contract, the Contractor shall submit 2 copies of the proposed "Air Blown Method" to the Engineer. The Contractor shall allow 15 days for the Engineer to review the proposed "Air Blown Method". If revisions are required, as determined by the Engineer, the Contractor shall revise and resubmit the proposed "Air Blown Method" within 5 days of receipt of the Engineer's comments and shall allow 5 days for the Engineer to review the revisions. Upon the Engineer's approval of the proposed "Air Blown Method", 2 additional copies of the proposed "Air Blown Method" incorporating the required changes shall be submitted to the Engineer. Minor changes or clarifications to the initial submittal may be made and attached as amendments to the proposed "Air Blown Method". In order to allow construction activities to proceed, the Engineer may conditionally approve, in writing, the proposed "Air Blown Method" while minor revisions or amendments are being completed.

The submitted "Air Blown Method" shall not be used until it has been approved in writing by the Engineer.

10-3.21 TRENCH DELINEATOR

Trench delineator shall consist of a flexible post conforming to the provisions in Section 82, "Markers and Delineators," of the Standard Specifications and these special provisions.

Delineators on flexible posts shall be as specified in "Approved Traffic Products" elsewhere in these special provisions. Flexible posts shall be made from a flexible white plastic which shall be resistant to impact, ultraviolet light, ozone, and hydrocarbons. Flexible posts shall resist stiffening with age and shall be free of burns, discoloration, contamination, and other objectionable marks or defects which affect appearance or serviceability.

Flexible posts shall be installed at locations shown on the plans directly above fiber optic conduit (in the same trench) offset enough to not hit the warning tape.

The flexible post may be installed by placing it in the trench prior to backfilling and compacting or by placing it in a 450 mm steel anchor sleeve that is driven into the ground prior to installing the flexible post. The flexible post and anchor shall have locking tabs that prevent the removal of the flexible post from the anchor sleeve.

Flexible posts shall extend a minimum of 0.9 m and a maximum of 1.2 m above ground and a minimum of 450 mm and a maximum of 600 mm below ground.

The message on the flexible post shall be black text on orange non-reflective background, shall be located at the top of the post, and shall face approaching traffic. The message shall read: "WARNING, FIBER OPTIC CABLE". Below this message shall be a smaller message that reads: "BEFORE EXCAVATING OR IN AN EMERGENCY CALL CALTRANS, SAN DIEGO, CA (619) 688-6785".

10-3.22 SERVICE

Continuous welding of exterior seams in service equipment enclosures is not required.

Type III service equipment enclosures shall be the aluminum type.

Service enclosure shall not be painted.

Circuit breakers shall be the cable-in/cable-out type, mounted on non-energized clips. All circuit breakers shall be mounted vertically with the up position of the handle being the "ON" position.

Each service shall be provided with up to 2 main circuit breakers which shall disconnect ungrounded service entrance conductors.

A barrier terminal block rated for 60 A, minimum shall be provided in each service equipment enclosure.

Circuit breakers used as service disconnect equipment shall have a minimum interrupting capacity of 42 000 A, rms, for 120/240 V(ac) services and 30 000 A, rms, for 480 V(ac) services.

10-3.23 NUMBERING ELECTRICAL EQUIPMENT

Self-adhesive numbers will be State-furnished in conformance with the provisions in "Materials" of these special provisions.

The numbers shall be placed on the equipment where designated by the Engineer.

Where new numbers are to be placed on existing or relocated equipment, the existing numbers shall be removed.

Numbers shall be applied to a clean surface.

Where shown on the plans, equipment numbers shall be placed for all service equipment enclosures. On service equipment enclosures, the numbers shall be placed on the front door. On CCTV poles, the numbers shall be placed on the side nearest the roadway facing approaching traffic at a height up to 2.5-m above the base plate.

10-3.24 CCTV CABINETS

Type 334-CCTV cabinet shall consist of the following:

- 1) Housing
- 2) Mounting cage
- 3) Power distribution assembly
- 4) Thermostatically controlled fan
- 5) All necessary mounting hardware and wiring, foundation and anchor bolts and other equipment, as shown on the plans and specified in this special provisions.

The housing and the mounting cage shall conform to those of the Model 334 cabinet provisions of the "Traffic Signal Control Equipment Specifications" (TSCES) issued by the State of California, Department of Transportation, and to all addendum thereto current at the time of project advertising. Police panel however, is not required.

Foundations for housing Type 1 shall conform to the details on the Standard Plan ES-3C for Model 332 and 334 cabinets.

The power distribution assembly shall consist of the following: one 30 A, 120V minimum, single pole main breakers: eight standard 117 V_(ac) receptacles: and one duplex, 3 prong, NEMA Type 5-15R grounded utility type outlet. The power distribution assembly shall protect the equipment powered by the assembly from power transients. Over voltage protection shall be provided for the power distribution assembly and shall contain as a minimum, a surge arrester, which shall reduce the effect of power line voltage transients and be rated as follows:

Recurrent Peak Voltage	184 V
Energy Rating (Minimum)	20 J
Power Dissipation, Average	0.85 W
Peak Current for pulses less than 7 microseconds	1250 A
Stand-by Current for 60 Hz Sinusoidal	1 mA or less

The thermostatically controlled fan shall provide 4.25 m³ per minute of ventilation. The fan shall be activated when the temperature inside the cabinet exceeds 24°C and shut off when the temperature is less than 18°C. All vents shall be filtered. All cabinet assemblies shall be tested to demonstrate the correct function of all controls in the presence of the Engineer.

Door locks for the CCTV cabinets shall be a removable-core mortise cam cylinder door lock that receives the State's lock core. The State's lock core is a "Best" construction core. Keys shall be removable from the locks in the locked position only. Door locks shall be installed in conformance with the manufacturer's written instructions and recommendations. Two keys for each door lock shall be delivered to the Engineer.

10-3.25 STATE-FURNISHED CONTROLLER ASSEMBLIES

The Model 170 controller assemblies, including controller unit, completely wired controller cabinet and inductive loop detector sensor units, but without anchor bolts, will be State-furnished as provided under "Materials" of these special provisions.

The Contractor shall construct each controller cabinet foundation as shown on the plans for Model 332 and 334 cabinets (including furnishing and installing anchor bolts), shall install the controller cabinet on the foundation, and shall make field wiring connections to the terminal blocks in the controller cabinet.

A listing of field conductor terminations, in each State-furnished controller cabinet, will be furnished free of charge to the Contractor at the site of the work.

State forces will maintain controller assemblies. The Contractor's responsibility for controller assemblies shall be limited to conforming to the provisions in Section 6-1.02, "State-Furnished Materials," of the Standard Specifications.

10-3.26 DETECTORS

Loop detector sensor units will be State-furnished in conformance with the provisions in "Materials" of these special provisions.

Loop wire shall be Type 2.

Loop detector lead-in cable shall be Type B.

Slots shall be filled with elastomeric sealant or hot-melt rubberized asphalt sealant.

The depth of loop sealant above the top of the uppermost loop wire in the sawed slots shall be 50 mm, minimum.

Slots in portland cement concrete shall be filled with elastomeric sealant or hot-melt rubberized asphalt sealant, or shall be filled with an epoxy sealant conforming to the provisions in Section 95-2.09, "Epoxy Sealant for Inductive Loops (State Specification 8040-06)," of the Standard Specifications.

The ends of loop detector lead-in cables terminating at a controller cabinet with double row barrier terminal blocks shall have crimped and soldered ring terminals, otherwise the ends shall have approximately 19 mm of insulation removed and the exposed wire soldered.

10-3.27 FIBER OPTIC COMMUNICATION CABLE PLANT

FIBER OPTICS GLOSSARY

Breakout.--The cable "breakout" is produced by; (1) removing the jacket just beyond the last tie-wrap point, (2) exposing 1 to 2 meters of the cable buffers, aramid strength yarn and central fiberglass strength member, and (3) cutting the aramid yarn, central strength member and the buffer tubes to expose the individual glass fibers for splicing or connection to the appropriate device.

Connector.--A mechanical device used to align and join two fibers together to provide a means for attaching to and decoupling from a transmitter, receiver, or another fiber (patch panel).

Connectorized.--The termination point of a fiber after connectors have been affixed.

Couplers.--Couplers are devices which mate fiber optic connectors to facilitate the transition of optical light signals from one connector into another. They are normally located within FDFs mounted in panels. They may also be used unmounted, to join two simplex fiber runs.

Fiber Distribution Frame (FDF).--A rack mounted system that consists of a standard equipment rack, fiber routing guides, horizontal jumper troughs and Fiber Distribution Unit (FDU).

The FDF serves as the "home" for the passive fiber optic components from cable breakout, for connection by jumpers, to the electronics.

Fiber Distribution Unit (FDU)--Is an enclosure or rack-mountable unit containing both a patch panel with couplers and a splice tray(s).

F/O.--Fiber optic.

FOIP.--Fiber optic inside plant cable.

FOP.--Fiber optic outside plant cable.

FOTP.--Fiber optic test procedure(s) as defined by EIA/TIA standards.

Jumper.--A short fiber optic cable that has connectors installed on both ends, and is typically used for connection within a FDF.

Light Source.--Portable fiber optic test equipment that, in conjunction with a power meter, is used to perform end-to-end attenuation testing. It contains a stabilized light source operating at the designed wavelength of the system under test.

Link.--A passive section of the system, the ends of which are to be connected to active components. A link may include splices and couplers. For example, a video link may be from a F/O transmitter to a video multiplexer (MUX).

Link Loss Budget.--A calculation of the overall permissible attenuation from the fiber optic transmitter (source) to the fiber optic receiver (detector).

Loose Tube Cable.--Type of cable construction in which fibers are placed in filled buffer tubes to isolate them from outside forces (stress). A flooding compound is applied to the interstitial cable core to prevent water migration and penetration. This type of cable is primarily for outdoor applications.

Optical Time Domain Reflectometer (OTDR).--Fiber optic test equipment (similar in appearance to an oscilloscope) that is used to measure the total amount of power loss between two points and the corresponding distance. It provides a visual and printed display of the relative location of system components such as fiber sections, splices and connectors and the losses that are attributed to each component or defect in the fiber.

Patchcord.--A short jumper used to join two Connector Module Housing (CMH) couplers or a CMH and an active device (electronics).

Pigtail.--Short fiber optic cable that has a connector installed on only one end.

Plenum Cable.--NEC approved cable installed in air plenums (the area between a drop ceiling and the floor above it) without the use of conduit.

Power Meter.--Portable fiber optic test equipment that, in conjunction with a light source, is used to perform end-to-end attenuation testing. It contains a detector that is sensitive to light at the designed wavelength of the system under test. Its display indicates the amount of power injected by the light source that arrives at the receiving end of the link.

Riser Cable.--NEC approved cable installed in a riser (a vertical shaft in a building connecting one floor to another).

Segment.--A section of F/O cable that is not connected to any active device and may or may not have splices per the design.

Splice.--The permanent joining of fiber ends to matching fibers.

Splice Closure.--Normally installed in a splice vault, a splice closure is an environmentally sealed container used to organize and protect splice trays. The container allows splitting or routing of fiber cables from multiple locations.

Splice Module Housing (SMH).--The SMH stores splice trays as well as pigtailed and short cable lengths.

Splice Tray.--A container used to organize and protect spliced fibers.

Splice Vault.--A splice vault is used to house splice closures.

Storage Cabinet.--Designed for holding excess cable slack for protection. The storage cabinet allows the user flexibility in equipment location and the ability to pull cable back for resplicing.

Tight Buffered, Non-Breakout Cable (Tight Buffer Cable).--Type of cable construction where each glass fiber is tightly buffered (directly coated) with a protective thermoplastic coating to 900 μm (compared to 250 μm for loose tube fibers). Increased buffering is desirable over loose tube cables because of its resulting ease of handling and connectorization (increased physical flexibility, smaller bend radius requirements), and ability to meet NEC flammability requirements.

FIBER OPTIC OUTSIDE PLANT CABLE

GENERAL

Each fiber optic outside plant cable (FOP) for this project shall be all dielectric, gel filled or water blocking materials, duct type, with loose buffer tubes and shall conform to these special provisions. Cables with singlemode fibers shall contain singlemode (SM) dual-window (1310 nm and 1550 nm) fibers in the quantities shown below and on the plans. The optical fibers shall be contained within loose buffer tubes. The loose buffer tubes shall be stranded around an all dielectric central member. Aramid yarn and/or fiberglass shall be used as a primary strength member, and a polyethylene outside jacket shall provide for overall protection.

All fiber optic (F/O) cable on this project shall be from the same manufacturer, who is regularly engaged in the production of this material.

The cable shall comply with all the requirements of the United States Department of Agriculture Rural Electrification Administration specifications REA-PE-90 as described elsewhere in these Special Provisions.

Type A fiber optic cable shall contain 60 singlemode fibers.

Type B fiber optic cable shall contain 48 singlemode fibers.

Type C fiber optic cable shall contain 6 singlemode fibers.

FIBER CHARACTERISTICS

Each optical fiber shall be glass and consist of a doped silica core surrounded by concentric silica cladding. All fibers in the buffer tube shall be usable fibers, and shall be sufficiently free of surface imperfections and inclusions to meet the optical, mechanical, and environmental requirements of these specifications. The required fiber grade SM shall reflect the maximum individual fiber attenuation, to guarantee the required performance of each and every fiber in the cable.

The coating shall be a dual layered, UV cured acrylate. The coating shall be mechanically or chemically strippable without damaging the fiber.

The cable shall comply with the optical and mechanical requirements over an operating temperature range of -40°C to $+70^{\circ}\text{C}$. The cable shall be tested in accordance with EIA-455-3A (FOTP-3), "Procedure to Measure Temperature Cycling Effects on Optical Fiber, Optical Cable, and Other Passive Fiber Optic Components." The change in attenuation at extreme operational temperatures (-40°C to $+70^{\circ}\text{C}$) for singlemode fiber shall not be greater than 0.20 dB/km, with 80 percent of the measured values no greater than 0.10 dB/km. The singlemode fiber measurement is made at 1550 nm.

For all fibers the attenuation specification shall be a maximum attenuation for each fiber over the entire operating temperature range of the cable.

Singlemode fibers within the finished cable shall meet the requirements in the following table:

Fiber Characteristics Table	
Parameters	Singlemode
Type	Step Index
Core diameter	8.3 μm (nominal)
Cladding diameter	125 μm ± 1.0 μm
Core to Cladding Offset	0.8 μm
Coating Diameter	250 μm ± 15 μm
Cladding Non-circularity defined as: [1-(min. cladding dia \div max. cladding dia.)] $\times 100$	1.0%
Proof/Tensile Test	345 Mpa, min.
Attenuation: (-40°C to +70°C) @1310 nm @1550 nm	0.4 dB/km 0.3 dB/km
Attenuation at the Water Peak	2.1 dB/km @ 1383 ± 3 nm
Chromatic Dispersion: Zero Dispersion Wavelength Zero Dispersion Slope	1301.5 to 1321.5 nm 0.092 ps/(nm ² *km)
Maximum Dispersion:	3.3 ps/(nm*km) for 1285 – 1330 nm <18 ps/(nm*km) for 1550 nm
Cut-Off Wavelength	<1260 nm
Mode Field Diameter (Petermann II)	9.3 ± 0.5 μm at 1300 nm 10.5 ± 1.0 μm at 1550 nm

COLOR CODING

Optical fibers shall be distinguishable from others in the same buffer tube by means of color coding according to the following:

- | | |
|----------------|-----------------|
| 1. Blue (BL) | 7. Red (RD) |
| 2. Orange (OR) | 8. Black (BK) |
| 3. Green (GR) | 9. Yellow (YL) |
| 4. Brown (BR) | 10. Violet (VL) |
| 5. Slate (SL) | 11. Rose (RS) |
| 6. White (WT) | 12. Aqua (AQ) |

The colors shall be targeted in accordance with the Munsell color shades and shall meet EIA/TIA-598 "Color Coding of Fiber Optic Cables."

The color formulation shall be compatible with the fiber coating and the buffer tube filling compound, and be heat stable. It shall not fade or smear or be susceptible to migration and it shall not affect the transmission characteristics of the optical fibers and shall not cause fibers to stick together.

CABLE CONSTRUCTION

General.--The fiber optic cable shall consist of, but not be limited to, the following components:

- A. Buffer tubes
- B. Central member
- C. Filler rods
- D. Stranding
- E. Core and cable flooding
- F. Tensile strength member
- G. Ripcord
- H. Outer jacket

Buffer tubes.--Loose buffer tubes shall provide clearance between the fibers and the inside of the tube to allow for expansion without constraining the fiber. The fibers shall be loose or suspended within the tubes and shall not adhere to the inside of the tube. Each buffer tube shall contain 6 or 12 fibers.

The loose buffer tubes shall be extruded from a material having a coefficient of friction sufficiently low to allow free movement of the fibers. The material shall be tough and abrasion resistant to provide mechanical and environmental protection of the fibers, yet designed to permit safe intentional "scoring" and breakout, without damaging or degrading the internal fibers.

Buffer tube filling compound shall be a homogenous hydrocarbon-based gel with anti-oxidant additives and used to prevent water intrusion and migration. The filling compound shall be non-toxic and dermatologically safe to exposed skin. It shall be chemically and mechanically compatible with all cable components, non-nutritive to fungus, non-hygroscopic and electrically non-conductive. The filling compound shall be free from dirt and foreign matter and shall be readily removable with conventional nontoxic solvents.

Buffer tubes shall be stranded around a central member by a method that will prevent stress on the fibers when the cable jacket is placed under strain, such as the reverse oscillation stranding process.

Each buffer tube shall be distinguishable from other buffer tubes in the cable by means of color coding as specified above for fibers.

Central Member.--The central member which functions as an anti-buckling element shall be a glass reinforced plastic rod with similar expansion and contraction characteristics as the optical fibers and buffer tubes. A linear overcoat of low density polyethylene shall be applied to the central member to achieve the optimum diameter to provide the proper spacing between buffer tubes during stranding.

Filler rods.--Fillers may be included in the cable to lend symmetry to the cable cross-section where needed. Filler rods shall be solid medium or high density polyethylene. The diameter of filler rods shall be the same as the outer diameter of the buffer tubes.

Stranding.--Completed buffer tubes shall be stranded around the overcoated central member using stranding methods, lay lengths and positioning such that the cable shall meet mechanical, environmental and performance specifications. A polyester binding shall be applied over the stranded buffer tubes to hold them in place. Binders shall be applied with sufficient tension to secure the buffer tubes to the central member without crushing the buffer tubes. The binders shall be non-hygroscopic, non-wicking (or rendered so by the flooding compound), and dielectric with low shrinkage.

Core and Cable Flooding.--The cable core interstices shall be filled with a polyolefin based compound to prevent water ingress and migration. The flooding compound shall be homogeneous, non-hygroscopic, electrically non-conductive, and non-nutritive to fungus. The compound shall also be nontoxic, dermatologically safe and compatible with all other cable components.

Tensile Strength Member.--Tensile strength shall be provided by high tensile strength aramid yarns and/or fiberglass which shall be helically stranded evenly around the cable core and shall not adhere to other cable components.

Ripcord.--The cable shall contain at least one ripcord under the jacket for easy sheath removal.

Outer jacket.--The jacket shall be free of holes, splits, and blisters and shall be medium or high density polyethylene (PE), or medium density cross-linked polyethylene with minimum nominal jacket thickness of 1000 ± 76 μm . Jacketing material shall be applied directly over the tensile strength members and flooding compound and shall not adhere to the

aramid strength material. The polyethylene shall contain carbon black to provide ultraviolet light protection and shall not promote the growth of fungus.

The jacket or sheath shall have clear, distinctive and permanent markings showing the manufacturer's name, the words "Optical Cable", the number of fibers, "SM", year of manufacture, and sequential measurement markings every meter. The actual length of the cable shall be within -0/+1 percent of the length marking. The marking shall be in a contrasting color to the cable jacket. The height of the marking shall be approximately 2.5 mm.

GENERAL CABLE PERFORMANCE SPECIFICATIONS

The F/O cable shall withstand water penetration when tested with a one meter static head or equivalent continuous pressure applied at one end of a one meter length of filled cable for one hour. No water shall leak through the open cable end. Testing shall be done in accordance with EIA-455-82 (FOTP-82), "Fluid Penetration Test for Fluid-Blocked Fiber Optic Cable."

A representative sample of cable shall be tested in accordance with EIA-455-81A (FOTP-81), "Compound Flow (Drip) Test for Filled Fiber Optic Cable". No preconditioning period shall be conducted. The cable shall exhibit no flow (drip or leak) at 80°C as defined in the test method.

A representative sample of cable shall be tested in accordance with EIA-455-81A, "Compound Flow (Drip) Test for Filled Fiber Optic Cable". The test sample shall be prepared in accordance with Method A. The cable shall exhibit no flow (drip or leak) at 80°C as defined in the test method.

Crush resistance of the finished F/O cables shall be 220 N/cm applied uniformly over the length of the cable without showing evidence of cracking or splitting when tested in accordance with EIA-455-41 (FOTP-41), "Compressive Loading Resistance of Fiber Optic Cables." The average increase in attenuation for the fibers shall be 0.10 dB at 1550 nm (singlemode) for a cable subjected to this load. The cable shall not exhibit any measurable increase in attenuation after removal of load. Testing shall be in accordance with EIA-455-41 (FOTP-41), except that the load shall be applied at the rate of 3 mm to 20 mm per minute and maintained for 10 minutes.

The cable shall withstand 25 cycles of mechanical flexing at a rate of 30 ± 1 cycles/minute. The average increase in attenuation for the fibers shall be 0.20 dB at 1550 nm (singlemode) at the completion of the test. Outer cable jacket cracking or splitting observed under 10x magnification shall constitute failure. The test shall be conducted in accordance with EIA-455-104 (FOTP-104), "Fiber Optic Cable Cyclic Flexing Test," with the sheave diameter a maximum of 20 times the outside diameter of the cable. The cable shall be tested in accordance with Test Conditions I and II of (FOTP-104).

The cable shall withstand 20 impact cycles with total impact energy of 5.9 Nm. The average increase in attenuation for the fibers shall be 0.20 dB at 1550 nm (singlemode). The cable jacket shall not exhibit evidence of cracking or splitting. The test shall be conducted in accordance with EIA-455-25 (FOTP-25), "Impact Testing of Fiber Optic Cables and Cable Assemblies."

The finished cable shall withstand a tensile load of 2700 N without exhibiting an average increase in attenuation of greater than 0.20 dB. The test shall be conducted in accordance with EIA-455-33 (FOTP-33), "Fiber Optic Cable Tensile Loading and Bending Test." The load shall be applied for one-half hour in Test Condition II of the EIA-455-33 (FOTP-33) procedure.

PACKAGING AND SHIPPING REQUIREMENTS

Documentation of compliance to the required specifications shall be provided to the Engineer prior to ordering the material.

Attention is directed to "Fiber Optic Testing," elsewhere in these special provisions.

The completed cable shall be packaged for shipment on reels. The cable shall be wrapped in a weather and temperature resistant covering. Both ends of the cable shall be sealed to prevent the ingress of moisture.

Each end of the cable shall be securely fastened to the reel to prevent the cable from coming loose during transit. Four meters of cable length on each end of the cable shall be accessible for testing.

Each cable reel shall have a durable weatherproof label or tag showing the manufacturer's name, the cable type, the actual length of cable on the reel, the Contractor's name, the contract number, and the reel number. A shipping record shall also be included in a weatherproof envelope showing the above information and also include the date of manufacture, cable characteristics (size, attenuation, bandwidth, etc.), factory test results, cable identification number and any other pertinent information.

The minimum hub diameter of the reel shall be at least thirty times the diameter of the cable. The F/O cable shall be in one continuous length per reel with no factory splices in the fiber. Each reel shall be marked to indicate the direction the reel should be rolled to prevent loosening of the cable.

Two copies of the installation procedures and technical support information shall be furnished to the Engineer at least two weeks subsequent to the start of the scheduled delivery.

10-3.28 FIBER OPTIC LABELING

GENERAL

All fiber optic and copper communication cables shall be labeled in a permanent and consistent manner. All labels shall be made of a material designed for permanent labeling. All labels shall be mechanically marked with permanent ink on non-metal type labels, or embossed lettering on metal type labels; hand written labels using pencil shall not be used except as noted below. Metal tags shall be constructed of stainless steel. Metal tags are required for use on fiber optic cables. Use of non-metal label materials shall be only as approved by the Engineer. At vaults and other underground locations, all labels and imprinting shall be weatherproof. Labels shall be affixed per the manufacturer's recommendations in a manner that will not cause damage to the cable, conductor or fiber.

CABLE IDENTIFICATION

Identification used for labeling of the fiber optic and copper cables will be provided to the Contractor by the Engineer. The quantity of characters will not be more than 40 for cables and not more than 20 for individual conductors or fibers.

LABEL PLACEMENT

Fiber Optic Cables.--All cables shall be labeled at all terminations, even if no connections or splices are made, and at all splice vault entrance and exit points.

Cable to Cable Splices.--The cable shall be labeled at entry to splice enclosure.

Cable to Fiber Distribution Units.--The cable shall be labeled at entry to the FDU. Only one cable shall be terminated in each FDU. The FDU shall be labeled on the face of the FDU. Individual connections shall be clearly marked in pencil on the face of the FDU in the designated area as directed by the Engineer.

Fibers.--Fiber labels shall be placed next to the connectors of the individual fibers.

Patch Panels.--The cable shall be labeled at entry to the Patch Panel. Only one cable shall be terminated in each FDU. The Patch Panels shall be clearly labeled on the face of the Panel. Individual connections shall be clearly marked in pencil on the face of the Panel in the designated area as directed by the Engineer.

Jumpers.--Equipment to FDU Jumpers shall be labeled at both ends. FDU to FDU jumpers shall be labeled at each end.

Pigtails.--Pigtails shall be labeled at the connector.

Copper Cables.--All copper communication cables shall be labeled at terminations and splices.

10-3.29 FIBER OPTIC CABLE INSTALLATION

Installation procedures shall be in conformance with the procedures specified by the cable manufacturer for the specific cable being installed. Mechanical aids may be used, provided that a tension measuring device is placed in tension to the end of the cable, and the allowable tension does not exceed the manufacturers recommended pulling tension.

Except when the "Air Blown Method" is used, F/O cable shall be installed using a cable pulling lubricant recommended by the F/O cable and/or the conduit manufacturer and a non-abrasive pull tape conforming to the provisions described under "Conduit" elsewhere in these special provisions.

Splices shall be limited to locations as shown on the plans and as directed by the Engineer.

During cable installation, the bend radius shall be maintained at not less than twenty times the outside diameter of the cable.

F/O cable shall be installed without splices except where specifically allowed on the plans or described in these special provisions. A minimum of 15 m of slack shall be provided at each vault without a cable splice. At fiber optic splice closures, a minimum of 9 m of each cable exiting the closure shall be stored in the vault.

Unless shown or provided otherwise, only one F/O cable shall be installed in each conduit.

10-3.30 SPLICING

Unless otherwise allowed, F/O cable splices shall be fusion type. The mean splice loss shall not exceed 0.07 dB per splice. The mean splice loss shall be obtained by measuring the loss through the splice in both directions and then averaging the resultant values.

The field splices shall connect the fibers of the two F/O cable lengths together. These splices shall be placed in a splice tray and these splice tray(s) shall then be placed in the splice closure.

Fibers of the same buffer tube, but not being spliced shall be placed in a splice tray along side spliced fibers. Buffer tubes that do not require enclosed fibers to be spliced shall not be disturbed and placed in the splice closure.

The termination splices shall connect the F/O cable span ends with pigtails. The termination splices shall be placed in a splice tray and the splice tray(s) shall then be placed in the fiber distribution unit (FDU). The individual fibers shall be looped one full turn within the splice tray to avoid micro bending. A 50 mm minimum bend radius shall be maintained during installation and after final assembly in the optical fiber splice tray. Each bare fiber shall be individually restrained in a splice tray. The optical fibers in buffer tubes and the placement of the bare optical fibers in the splice tray shall be such that there is no discernible tensile force on the optical fiber.

All splices shall be protected with a metal reinforced thermal shrink sleeve.

All fiber optic cables shall be labeled in the splice tray. Pigtail ends shall also be labeled to identify the destination of the fiber.

10-3.31 FIBER OPTIC SPLICE CLOSURE

The fiber optic field splices shall be enclosed in splice closures which shall be complete with splice organizer trays, brackets, clips, cable ties, and sealant, as needed. The splice closure shall be suitable for a direct burial or pullbox application. Manufacturer's installations shall be supplied to the Engineer prior to the installation of any splice closures. Location of the splice closures shall be where a splice is required as shown on the plans, designated by the Engineer, or described in these special provisions.

The splice closure shall conform to the following specifications:

- Non filled thermoplastic case

- Rodent proof, water proof, re-enterable and moisture proof

- Expendable from 2 cables per end to 8 cables per end by using adapter plates

- Cable entry ports shall accommodate 10 mm to 25 mm diameter cables

- Multiple grounding straps

- Accommodate up to 8 splice trays

- Suitable for "butt" or "through" cable entry configurations

- Place no stress on finished splices within the splice trays.

- The splice closure shall be bolted to the side wall of the splice vault.

- The fiber optic splice closure shall be suitable for a temperature range of 0°C to 40°C.

- Each splice shall be individually mounted and mechanically protected in the splice tray.

The Contractor shall install the fiber splice closure in the fiber optic vaults where splicing is required. The fiber optic splice closures shall be securely fastened to the fiber optic vault or wall using standard hardware as recommended by the closure manufacturer.

The Contractor shall provide all mounting hardware required to securely mount the closures to the splice vault.

The fiber splice closure shall be mounted horizontally in a manner that allows the cables to enter at the end of the closure. Not less than 9 m of each cable shall be coiled in the vault to allow the fiber splice closure to be removed for future splicing.

10-3.32 SPLICE TRAY

Splice trays shall:

- Accommodate quantity of not less than 12 fusion splices.

- Place no stress on completed splices within the tray.

- Accommodate "butt" or "feed through" splicing applications.

- Be stackable with a transparent snap-on hinge cover.

- Accommodate buffer tubes securable with channel straps.

- Contain fiber retention strips.

10-3.33 PASSIVE CABLE ASSEMBLIES AND COMPONENTS

The F/O cable assemblies and components shall be compatible components, designed for the purpose intended, and manufactured by a company regularly engaged in the production of material for the fiber optic industry. All components or assemblies shall be best quality, non-corroding, with a design life of at least 20 years. All components or assemblies of the same type shall be from the same manufacturer.

10-3.34 FIBER OPTIC CABLE TERMINATIONS

GENERAL

Fiber optic outside plant cable entering a cabinet or enclosure shall be routed as described in these special provisions and as shown on the plans. The cable shall continue within the conduit to the designated termination point for distribution "breakout."

All components shall be the size and type required for the specified fiber.

FIBER OPTIC CABLE ASSEMBLIES AND PIGTAILS

General.--Cable assemblies (jumpers and pigtails) shall be products of the same manufacturer. The cable used for cable assemblies shall be made of fiber meeting the performance requirements of these special provisions for the F/O cable being connected.

Jumpers.--Jumpers may be of simplex or duplex design. Duplex jumpers shall be of duplex round cable construction, and shall not have zipcord (siamese) construction. All jumpers shall be at least 2 m in length, sufficient to avoid stress and allow orderly routing.

The outer jacket of duplex jumpers shall be colored according to the singlemode color (yellow) specified above. The two inner simplex jackets shall be contrasting colors to provide easy visual identification for polarity.

Connectors.--Connectors shall be of the ceramic ferrule SC type for SM. Indoor SC connector body housings shall be either nickel plated zinc or glass reinforced polymer construction. Outdoor SC connector body housing shall be glass reinforced polymer.

The associated coupler shall be of the same material as the connector housing.

All F/O connectors shall be the 2.5 mm SC connector ferrule type with Zirconia Ceramic material with a PC (Physical Contact) pre-radiused tip.

The SC connector operating temperature range shall be -40°C to +70°C. Insertion loss shall not exceed 0.4 dB for singlemode, and the return reflection loss on singlemode connectors shall be at least 55 dB. Connection durability shall be less than a 0.2 dB change per 500 mating cycles per EIA-455-21A (FOTP-21). All terminations shall provide a minimum 222 N pull out strength. Factory test results shall be documented and submitted to the Engineer prior to installing any of the connectors. Singlemode connectors shall have a yellow color on the body and/or boot that renders them easily identifiable.

Field terminations shall be limited to splicing of adjoining cable ends and/or cables to SC pigtails.

10-3.35 FIBER OPTIC TESTING

GENERAL

Testing shall include the tests on elements of the passive fiber optic components: (1) at the factory, (2) after delivery to the project site but prior to installation and, (3) after installation. The Contractor shall provide all personnel, equipment, instrumentation and materials necessary to perform all testing. The Engineer shall be notified two working days prior to all field tests. The notification shall include the exact location or portion of the system to be tested.

A minimum of 15 working days prior to arrival of the cable at the site, the Contractor shall provide detailed test procedures for all field testing for the Engineer's review and approval. The procedures shall identify the tests to be performed and how the tests are to be conducted. Included in the test procedures shall be the model, manufacturer, configuration, calibration and alignment procedures for all proposed test equipment.

Documentation of all test results shall be provided to the Engineer within 2 working days after the test is completed.

FACTORY TESTING

Documentation of compliance with the fiber specifications as listed in the fiber characteristics table shall be supplied by the original fiber manufacturer. Before shipment, but while on the shipping reel, 100 percent of all fibers shall be tested for attenuation. Copies of the results shall be attached to the cable reel in a waterproof pouch and submitted to the Contractor and to the Engineer.

ARRIVAL ON SITE

The cable and reel shall be physically inspected on delivery and the attenuation shall be measured for 100 percent of the fibers. The failure of any single fiber in the cable to comply with these special provisions, is cause for rejection of the entire reel. Test results shall be recorded, dated, compared and filed with the copy accompanying the shipping reel in a weather proof envelope. Attenuation deviations from the shipping records of greater than 5 percent shall be brought to the attention of the Engineer. The cable shall not be installed until completion of this test sequence and the Engineer provides written

approval. Copies of traces and test results shall be submitted to the Engineer. If the test results are unsatisfactory, the reel of fiber optic cable shall be considered unacceptable and all records corresponding to that reel of cable shall be marked accordingly. The unsatisfactory reels of cable shall be replaced with new reels of cable at the Contractor's expense. The new reels of cable shall then be tested to demonstrate acceptability. Copies of the test results shall be submitted to the Engineer.

AFTER CABLE INSTALLATION

After the fiber optic cable has been pulled but before breakout and termination, 100 percent of all the fibers shall be tested with an OTDR for attenuation. Test results shall be recorded, dated, compared and filed with the previous copies of these tests. Copies of traces and test results shall be submitted to the Engineer. If the OTDR test results are unsatisfactory, the F/O cable segment will be unacceptable. The unsatisfactory segment of cable shall be replaced with a new segment, without additional splices, at the Contractor's expense. The new segment of cable shall then be tested to demonstrate acceptability. Copies of the test results shall be submitted to the Engineer.

Singlemode fibers shall be tested at 1310 nm and 1550 nm. Attenuation readings for each direction shall be recorded on the cable data sheet.

OUTDOOR SPLICES

At the conclusion of all outdoor splices at one location, and before they are enclosed and sealed, all splices shall be tested with the OTDR, in both directions. Splices in segments shall be tested at 1310 nm and at 1550 nm. Individual fusion splice losses shall not exceed 0.07 dB. Measurement results shall be recorded, dated, validated by the OTDR trace printout and filed with the records of the respective cable runs. Copies of traces and test results shall be submitted to the Engineer. If the OTDR test results are unsatisfactory, the splice shall be unacceptable. The unsatisfactory splice shall be replaced at the Contractor's expense. The new splice shall then be tested to demonstrate acceptability. Copies of the test results shall be submitted to the Engineer.

DISTRIBUTION INTERCONNECT PACKAGE TESTING AND DOCUMENTATION

All the components of the passive interconnect package (FDUs, pigtails, jumpers, couplers and splice trays as shown on the plans and in these special provisions) shall comprise a unit from a manufacturer who is regularly engaged in the production of the fiber optic components.

In developing the distribution interconnect package, each SC termination (pigtail or jumper) shall be tested for insertion attenuation loss with the use of an optical power meter and light source. In addition, all singlemode terminations shall be tested for return reflection loss. These values shall meet the loss requirements specified earlier and shall be recorded on a tag attached to the pigtail or jumper.

Once assembly is complete, the manufacturer shall visually verify that all tagging, including loss values, is complete. Then as a final quality control measure, the manufacturer shall do an "end to end" optical power meter/light source test from pigtail end to jumper lead end to assure continuity and overall attenuation loss values.

The final test results shall be recorded, along with previous individual component values, on a special form assigned to each FDU. The completed form shall be dated and signed by the Manufacturer's Quality Control supervisor. One copy of this form will be attached in a plastic envelope to the assembled FDU unit. Copies will be provided separately to the Contractor and to the Engineer, and shall be also be maintained on file by the manufacturer or supplier.

SYSTEM VERIFICATION AT COMPLETION

OTDR Testing.--Once the passive cabling system has been installed and is ready for activation, 100 percent of the fiber links shall be tested with the OTDR for attenuation. Print out shall include at least link number, fiber color, buffer color and cable number. Test results shall be recorded, dated, compared and filed with previous copies. A hard copy printout and an electronic copy of the traces and test results along with a licensed copy of the associated software on a DOS based 89 mm disk shall be submitted to the Engineer. If the OTDR test results are unsatisfactory the link shall be replaced at the Contractor's expense. The new link shall then be tested to demonstrate acceptability. Copies of the test results shall be submitted to the Engineer.

Power Meter and Light Source.--At the conclusion of the final OTDR testing, 100 percent of all fiber links shall be tested end to end with a power meter and light source, in accordance with EIA Optical Test Procedure 171 and in the same wavelengths specified for the OTDR tests. These tests shall be conducted in both directions. Test results shall be recorded, compared and proven to be within the design link loss budgets, and filed with the other recordings of the same links. Test results shall be submitted to the Engineer.

Cable Verification Worksheet.--The Cable Verification Worksheet shown in Appendix A shall be completed for 100 percent of all links in the fiber optic system, using the data gathered during cable verification. The completed worksheets shall be included as part of the system documentation.

Test Failures.--If the link loss measured from the power meter and light source exceeds the calculated link loss, or the actual location of the fiber ends does not agree with the expected location of the fiber ends (as would occur with a broken fiber), the fiber optic link will not be accepted. The unsatisfactory segments of cable, or splices shall be replaced with a new segment of cable or splice at the Contractor's expense. The OTDR testing, power meter and light source testing and Cable Verification Worksheet shall be completed for the repaired link to determine acceptability. Copies of the test results shall be submitted to the Engineer. The removal and replacement of a segment of cable shall be interpreted as the removal and replacement of a single contiguous length of cable connecting two splices, two connectors or one splice and one connector. The removal of only the small section containing the failure and therefore introducing new unplanned splices, will not be allowed.

APPENDIX A

Link Loss Budget Worksheet

Contract No. _____

Contractor: _____

Approved by Caltrans: _____

Date: _____

Operator: _____

Link Number: _____

Fiber Color: _____

Buffer Color: _____

Cable No.: _____

Test Wavelength (Circle one): 1310 1550

Expected Location of fiber ends:

End 1: _____ End 2: _____

OTDR Test Results:

Forward Loss: _____ dB 1A

Reverse Loss: _____ dB 1B

Average Loss: _____ dB 1C

Power Meter and Light Source Test Results:

Forward Loss: _____ dB 2A

Reverse Loss: _____ dB 2B

Average Loss $[(2A + 2B)/2]$: _____ dB 2C

Calculated Fiber Loss:

Length of the link (from OTDR): _____ km 3A

Allowed loss per km of fiber: 0.4 dB/km 3B

Total Allowed Loss due to the fiber ($3A * 3B$): _____ dB 3C

Calculated Splice Loss:

Number of Splices in the Link: _____ 4A

Allowed Link Loss per Splice: 0.07 dB 4B

Total Allowed Loss due to Splices ($4A * 4B$): _____ dB 4C

Calculated Link Loss:

Connector Loss: 0.9 dB 5A

Total Link Loss ($5A + 3C + 4C$): _____ dB 5B

Cable Verification:

Compare Power Meter Average Loss to Calculated Link Loss ($2C - 5B$): _____ dB 6A

If the value of 6A is greater than zero, the link has failed the Test. See Test Failures elsewhere in these special provisions.

To Be Completed by Caltrans:

Resident Engineer's Signature: _____

Cable Link Accepted: _____

10-3.36 FIBER DISTRIBUTION UNIT

The Contractor shall furnish and install all related equipment to interface the fiber distribution unit (FDU) to the incoming fiber optic communication cables.

The units shall accommodate the three sizes of fiber optic cable described elsewhere in these special provisions.

Type A FDU shall accommodate termination of not less than 60 individual fibers.

Type B FDU shall accommodate termination of not less than 48 individual fibers.

Type C FDU shall accommodate termination of not less than 12 individual fibers.

The FDU shall provide interconnect capability and shall include the following:

A patch panel to terminate singlemode fiber with SC type connector feed through adapters.

Storage for splice trays.

A slide out metal shelf for the storage of 6 spare jumpers each measuring 1 meter long for Type A and B only.

The patch panel shall be hinged to provide easy access and maintenance. Brackets shall be provided to spool the incoming fiber a minimum of three turns, each turn of not less than 250 mm in length, before separating out individual fibers to the splice tray. Strain relief shall be provided for the incoming fiber optic cable. All fibers shall be terminated and identified in the FDU.

The FDU (Type A and B) shall be 475 mm rack mountable and not to exceed 435 mm (W) x 500 mm (H) x 375 mm (D).

The FDU (Type C) shall be 475 mm rack mountable and not to exceed 435 mm (W) x 50 mm (H) x 305 mm (D).

10-3.37 TRAINING

DESCRIPTION--A training course shall be developed by the Contractor and shall be given to the Engineer and designated personnel prior to the installation of any fiber optic cables at the project location. A training area will be provided by the State at the District Office, located at 2829 Juan Street, San Diego, CA 92110.

The training course shall provide training for technical personnel, and shall follow a training outline prepared by the Contractor. The Contractor shall provide all materials and instructors for the training course. The training course shall be not less than two eight-hour (excluding lunch and breaks) days in duration. No more than 20 State employees with technical backgrounds will attend this training course. Each person shall receive a training manual. The training manual shall be written especially for the fiber optic cable on the project. In addition, the training manual shall provide complete procedures for operating, maintaining, and trouble-shooting the fiber optic cable on the project. The maintenance section of the training course shall cover preventive, routine and emergency maintenance procedures. The emergency maintenance discussion shall provide recommendations for the provisioning and use of an emergency repair kit to assist maintenance crews. The maintenance section of the manual shall include a list of all replaceable parts with exact parts description and number and a directory of recommended suppliers with correspondence address, telephone and fax numbers.

The training course shall also include "hands on" field training using operational equipment. The field training shall include the operational checkout of a sample fiber optic cable.

The information for this training course shall be separated into appropriately titled sections such as:

- A. Fiber Optic Theory
- B. Fiber Optic Cable Types and Installation
- C. Fiber Optic Cable Splicing (Mechanical and Fusion)
- D. Testing and Field Inspection of Fiber Optic System
- E. Maintenance

The Contractor shall provide an evaluation sheet to be completed by the attendees. The evaluation sheets will be turned in to the Engineer and a copy will be provided to the Contractor. The evaluation sheets need not be signed by the attendees.

One copy of the manual for this training course shall be delivered to the Engineer for approval at least 4 weeks prior to the scheduled class time. The Engineer will notify the Contractor of the number of State personnel who are schedule to attend. Course documentation shall be delivered to the Engineer one week before the scheduled class.

10-3.38 REMOVING, REINSTALLING OR SALVAGING ELECTRICAL EQUIPMENT

Salvaged electrical materials shall be hauled to the District Recycle Center, 11900 Singer Lane, Spring Valley, CA 91978 and stockpiled.

The Contractor shall provide the equipment, as necessary, to safely unload and stockpile the material. A minimum of 2 working days' notice shall be given to the Engineer and the District Recycle Coordinator, telephone (619) 467-3293, prior to delivery.

10-3.39 PAYMENT

The contract unit price paid for closed circuit television pole shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in furnishing and installing closed circuit television pole, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

The contract price paid per meter for the various sizes and types of conductors and cables listed in the Engineer's Estimate shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in furnishing and installing conductor and cable listed in the Engineer's Estimate, complete in place, including splices and connectors, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

The contract unit price paid for modifying service equipment shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in modifying service equipment, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

The contract unit price paid for Model 334 cabinet foundations shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in furnishing and installing Model 334 cabinet foundations, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

The contract unit price paid for trench delineator shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in furnishing and installing trench delineator, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

The contract unit price paid for drilling existing cabinet foundation shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in drilling existing cabinet foundation, complete in place, as shown on the plans, as specified in these special provisions, and as directed by the Engineer.

The contract unit price paid for CCTV cabinets shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in furnishing and installing CCTV cabinets, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

The contract unit price paid for fiber optic vault shall include full compensation for furnishing all labor, materials (including fiber optic splice closure), tools, equipment, and incidentals, and for doing all the work involved in furnishing and installing fiber optic vault, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

The contract unit price paid for hub cabinet with foundation shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in furnishing and installing hub cabinet with foundation, complete in place, including earthwork and electrical equipment, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

The contract unit price paid for replacement of state-furnished cabinets shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in replacing state-furnished cabinets, complete in place, including salvaging existing controller assembly, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

The contract unit price paid for fiber distribution unit shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in furnishing and installing fiber distribution unit, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

The contract unit price paid for the various sizes and types of enclosures (including service equipment enclosures) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in furnishing and installing enclosures, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

MDCS will be measured and paid for in the same manner specified for conduit in Section 86 of the Standard Specifications.

The contract unit price paid for pull boxes shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in installing pull boxes, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

The contract unit price paid for inductive loop detectors shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in installing inductive loop detectors, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

The contract lump sum price paid for training shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in training, as specified in these special provisions, and as directed by the Engineer.

Full compensation for hand digging with hand tools shall be considered as included in the contract price paid per meter for the various sizes of conduit requiring the hand digging and no additional compensation will be allowed therefor.

Full compensation for hauling and stockpiling electrical materials shall be considered as included in the contract price paid for the item requiring the material to be salvaged, and no additional compensation will be allowed therefor.

SECTION 11. (BLANK)

SECTION 12. (BLANK)

SECTION 13. RELATIONS WITH RAILROAD

13-1.01 GENERAL

The Contractor's attention is directed to the tracks and right of way of Burlington Northern-Santa Fe Railway and Metropolitan Transit Development Board Light Rail, hereafter referred to as "Railroad," approximately at sta.360+90 and sta. 363+00 overhead respectively within the limits of the project.

The Contractor shall not permit any of his equipment or personnel on Railroad right of way. Contractor shall conduct his operations in a manner to prevent any debris from falling on Railroad's track or right of way.

In accordance with the provisions, in Section 7-1.12, "Responsibility for Damage," of the Standard Specifications, the Contractor shall be responsible for all the damages to Railroad's track, right of way and appurtenances thereto and to Railroad's equipment operating on such track and right of way resulting from his operations.

SECTION 14 FEDERAL REQUIREMENTS FOR FEDERAL-AID CONSTRUCTION PROJECTS

GENERAL.—The work herein proposed will be financed in whole or in part with Federal funds, and therefore all of the statutes, rules and regulations promulgated by the Federal Government and applicable to work financed in whole or in part with Federal funds will apply to such work. The "Required Contract Provisions, Federal-Aid Construction Contracts, "Form FHWA 1273, are included in this Section 14. Whenever in said required contract provisions references are made to "SHA contracting officer", "SHA resident engineer", or "authorized representative of the SHA", such references shall be construed to mean "Engineer" as defined in Section 1-1.18 of the Standard Specifications.

PERFORMANCE OF PREVIOUS CONTRACT.—In addition to the provisions in Section II, "Nondiscrimination," and Section VII, "Subletting or Assigning the Contract," of the required contract provisions, the Contractor shall comply with the following:

The bidder shall execute the CERTIFICATION WITH REGARD TO THE PERFORMANCE OF PREVIOUS CONTRACTS OR SUBCONTRACTS SUBJECT TO THE EQUAL OPPORTUNITY CLAUSE AND THE FILING OF REQUIRED REPORTS located in the proposal. No request for subletting or assigning any portion of the contract in excess of \$10,000 will be considered under the provisions of Section VII of the required contract provisions unless such request is accompanied by the CERTIFICATION referred to above, executed by the proposed subcontractor.

NON-COLLUSION PROVISION.—The provisions in this section are applicable to all contracts except contracts for Federal Aid Secondary projects.

Title 23, United States Code, Section 112, requires as a condition precedent to approval by the Federal Highway Administrator of the contract for this work that each bidder file a sworn statement executed by, or on behalf of, the person, firm, association, or corporation to whom such contract is to be awarded, certifying that such person, firm, association, or corporation has not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free competitive bidding in connection with the submitted bid. A form to make the non-collusion affidavit statement required by Section 112 as a certification under penalty of perjury rather than as a sworn statement as permitted by 28, USC, Sec. 1746, is included in the proposal.

PARTICIPATION BY MINORITY BUSINESS ENTERPRISES IN SUBCONTRACTING.—Part 23, Title 49, Code of Federal Regulations applies to this Federal-aid project. Pertinent sections of said Code are incorporated in part or in its entirety within other sections of these special provisions.

Schedule B—Information for Determining Joint Venture Eligibility

(This form need not be filled in if all joint venture firms are minority owned.)

1. Name of joint venture _____
2. Address of joint venture _____
3. Phone number of joint venture _____
4. Identify the firms which comprise the joint venture. (The MBE partner must complete Schedule A.) _____

 - a. Describe the role of the MBE firm in the joint venture. _____
 - b. Describe very briefly the experience and business qualifications of each non-MBE joint venturer: _____
5. Nature of the joint venture's business _____
6. Provide a copy of the joint venture agreement.
7. What is the claimed percentage of MBE ownership? _____
8. Ownership of joint venture: (This need not be filled in if described in the joint venture agreement, provided by question 6.).
 - a. Profit and loss sharing.
 - b. Capital contributions, including equipment.
 - c. Other applicable ownership interests.

9. Control of and participation in this contract. Identify by name, race, sex, and "firm" those individuals (and their titles) who are responsible for day-to-day management and policy decision making, including, but not limited to, those with prime responsibility for:

a. Financial decisions _____

b. Management decisions, such as:

(1) Estimating _____

(2). Marketing and sales _____

(3). Hiring and firing of management personnel _____

(4) Purchasing of major items or supplies _____

c. Supervision of field operations _____

Note.—If, after filing this Schedule B and before the completion of the joint venture's work on the contract covered by this regulation, there is any significant change in the information submitted, the joint venture must inform the grantee, either directly or through the prime contractor if the joint venture is a subcontractor.

Affidavit

"The undersigned swear that the foregoing statements are correct and include all material information necessary to identify and explain the terms and operation of our joint venture and the intended participation by each joint venturer in the undertaking. Further, the undersigned covenant and agree to provide to grantee current, complete and accurate information regarding actual joint venture work and the payment therefor and any proposed changes in any of the joint venture arrangements and to permit the audit and examination of the books, records and files of the joint venture, or those of each joint venturer relevant to the joint venture, by authorized representatives of the grantee or the Federal funding agency. Any material misrepresentation will be grounds for terminating any contract which may be awarded and for initiating action under Federal or State laws concerning false statements."

_____ Name of Firm	_____ Name of Firm
_____ Signature	_____ Signature
_____ Name	_____ Name
_____ Title	_____ Title
_____ Date	_____ Date

Date _____

State of _____

County of _____

On this ____ day of _____, 19 __, before me appeared (Name) _____, to me personally known, who, being duly sworn, did execute the foregoing affidavit, and did state that he or she was properly authorized by (Name of firm) _____ to execute the affidavit and did so as his or her free act and deed.

Notary Public _____

Commission expires _____

[Seal]

Date _____

State of _____

County of _____

On this ____ day of _____, 19 __, before me appeared (Name) _____ to me personally known, who, being duly sworn, did execute the foregoing affidavit, and did state that he or she was properly authorized by (Name of firm) _____ to execute the affidavit and did so as his or her free act and deed.

Notary Public _____

Commission expires _____

[Seal]

**REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS**

I. GENERAL

1. These contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.
2. Except as otherwise provided for in each section, the contractor shall insert in each subcontract all of the stipulations contained in these Required Contract Provisions, and further require their inclusion in any lower tier subcontract or purchase order that may in turn be made. The Required Contract Provisions shall not be incorporated by reference in any case. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with these Required Contract Provisions.
3. A breach of any of the stipulations contained in these Required Contract Provisions shall be sufficient grounds for termination of the contract.
4. A breach of the following clauses of the Required Contract Provisions may also be grounds for debarment as provided in 29 CFR 5.12:

Section I, paragraph 2;

Section IV, paragraphs 1, 2, 3, 4, and 7;

Section V, paragraphs 1 and 2a through 2g.

5. Disputes arising out of the labor standards provisions of Section IV (except paragraph 5) and Section V of these Required Contract Provisions shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the U.S. Department of Labor (DOL) as set forth in 29 CFR 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the DOL, or the contractor's employees or their representatives.
6. **Selection of Labor:** During the performance of this contract, the contractor shall not:
 - a. discriminate against labor from any other State, possession, or territory of the United States (except for employment preference for Appalachian contracts, when applicable, as specified in Attachment A), or
 - b. employ convict labor for any purpose within the limits of the project unless it is labor performed by convicts who are on parole, supervised release, or probation.

II. NONDISCRIMINATION

(Applicable to all Federal-aid construction contracts and to all related subcontracts of \$10,000 or more.)

1. **Equal Employment Opportunity:** Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630, and 41 CFR 60) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under this contract. The Equal Opportunity Construction Contract Specifications set forth under 41 CFR 60-4.3 and the provisions of the American Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:
 - a. The contractor will work with the State highway agency (SHA) and the Federal Government in carrying out EEO obligations and in their review of his/her activities under the contract.
 - b. The contractor will accept as his operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall

include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, preapprenticeship, and/or on-the-job training."

2. **EEO Officer:** The contractor will designate and make known to the SHA contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active contractor program of EEO and who must be assigned adequate authority and responsibility to do so.
3. **Dissemination of Policy:** All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:
 - a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.
 - b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.
 - c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minority group employees.
 - d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.
 - e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.
4. **Recruitment:** When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minority groups in the area from which the project work force would normally be derived.
 - a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minority group applicants. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority group applicants may be referred to the contractor for employment consideration.
 - b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, he is expected to observe the provisions of that agreement to the extent that the system permits the contractor's compliance with EEO contract provisions. (The DOL has held that where implementation of such agreements have the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Executive Order 11246, as amended.)
 - c. The contractor will encourage his present employees to refer minority group applicants for employment. Information and procedures with regard to referring minority group applicants will be discussed with employees.
5. **Personnel Actions:** Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:
 - a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

- b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.
 - c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.
 - d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with his obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of his avenues of appeal.
6. Training and Promotion:
- a. The contractor will assist in locating, qualifying, and increasing the skills of minority group and women employees, and applicants for employment.
 - b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision.
 - c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.
 - d. The contractor will periodically review the training and promotion potential of minority group and women employees and will encourage eligible employees to apply for such training and promotion.
7. **Unions:** If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use his/her best efforts to obtain the cooperation of such unions to increase opportunities for minority groups and women within the unions, and to effect referrals by such unions of minority and female employees. Actions by the contractor either directly or through a contractor's association acting as agent will include the procedures set forth below:
- a. The contractor will use best efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minority group members and women for membership in the unions and increasing the skills of minority group employees and women so that they may qualify for higher paying employment.
 - b. The contractor will use best efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.
 - c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the SHA and shall set forth what efforts have been made to obtain such information.
 - d. In the event the union is unable to provide the contractor with a reasonable flow of minority and women referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minority group persons and women. (The DOL has held that it shall be no excuse that the union with which the contractor has a collective bargaining agreement providing for exclusive referral failed to refer minority employees.) In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the SHA.

8. **Selection of Subcontractors, Procurement of Materials and Leasing of Equipment:** The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment.
- a. The contractor shall notify all potential subcontractors and suppliers of his/her EEO obligations under this contract.
 - b. Disadvantaged business enterprises (DBE), as defined in 49 CFR 23, shall have equal opportunity to compete for and perform subcontracts which the contractor enters into pursuant to this contract. The contractor will use his best efforts to solicit bids from and to utilize DBE subcontractors or subcontractors with meaningful minority group and female representation among their employees. Contractors shall obtain lists of DBE construction firms from SHA personnel.
 - c. The contractor will use his best efforts to ensure subcontractor compliance with their EEO obligations.
9. **Records and Reports:** The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following completion of the contract work and shall be available at reasonable times and places for inspection by authorized representatives of the SHA and the FHWA.
- a. The records kept by the contractor shall document the following:
 - (1) The number of minority and non-minority group members and women employed in each work classification on the project;
 - (2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women;
 - (3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minority and female employees; and
 - (4) The progress and efforts being made in securing the services of DBE subcontractors or subcontractors with meaningful minority and female representation among their employees.
 - b. The contractors will submit an annual report to the SHA each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on Form FHWA-1391. If on-the-job training is being required by special provision, the contractor will be required to collect and report training data.

III. NONSEGREGATED FACILITIES

(Applicable to all Federal-aid construction contracts and to all related subcontracts of \$10,000 or more.)

- a. By submission of this bid, the execution of this contract or subcontract, or the consummation of this material supply agreement or purchase order, as appropriate, the bidder, Federal-aid construction contractor, subcontractor, material supplier, or vendor, as appropriate, certifies that the firm does not maintain or provide for its employees any segregated facilities at any of its establishments, and that the firm does not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. The firm agrees that a breach of this certification is a violation of the EEO provisions of this contract. The firm further certifies that no employee will be denied access to adequate facilities on the basis of sex or disability.
- b. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, restrooms and washrooms, restaurants and other eating areas, time clocks, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive, or are, in fact, segregated on the basis of race, color, religion, national origin, age or disability, because of habit, local custom, or otherwise. The only exception will be for the disabled when the demands for accessibility override (e.g. disabled parking).

- c. The contractor agrees that it has obtained or will obtain identical certification from proposed subcontractors or material suppliers prior to award of subcontracts or consummation of material supply agreements of \$10,000 or more and that it will retain such certifications in its files.

IV. PAYMENT OF PREDETERMINED MINIMUM WAGE

(Applicable to all Federal-aid construction contracts exceeding \$2,000 and to all related subcontracts, except for projects located on roadways classified as local roads or rural minor collectors, which are exempt.)

1. General:

- a. All mechanics and laborers employed or working upon the site of the work will be paid unconditionally and not less often than once a week and without subsequent deduction or rebate on any account [except such payroll deductions as are permitted by regulations (29 CFR 3)] issued by the Secretary of Labor under the Copeland Act (40 U.S.C. 276c) the full amounts of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment. The payment shall be computed at wage rates not less than those contained in the wage determination of the Secretary of Labor (hereinafter "the wage determination") which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor or its subcontractors and such laborers and mechanics. The wage determination (including any additional classifications and wage rates conformed under paragraph 2 of this Section IV and the DOL poster (WH-1321) or Form FHWA-1495) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers. For the purpose of this Section, contributions made or costs reasonably anticipated for bona fide fringe benefits under Section 1(b)(2) of the Davis-Bacon Act (40 U.S.C. 276a) on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of Section IV, paragraph 3b, hereof. Also, for the purpose of this Section, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs, which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in paragraphs 4 and 5 of this Section IV.
- b. Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein, provided, that the employer's payroll records accurately set forth the time spent in each classification in which work is performed.
- c. All rulings and interpretations of the Davis-Bacon Act and related acts contained in 29 CFR 1, 3, and 5 are herein incorporated by reference in this contract.

2. Classification:

- a. The SHA contracting officer shall require that any class of laborers or mechanics employed under the contract, which is not listed in the wage determination, shall be classified in conformance with the wage determination.
- b. The contracting officer shall approve an additional classification, wage rate and fringe benefits only when the following criteria have been met:
 - (1) the work to be performed by the additional classification requested is not performed by a classification in the wage determination;
 - (2) the additional classification is utilized in the area by the construction industry;
 - (3) the proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination; and
 - (4) with respect to helpers, when such a classification prevails in the area in which the work is performed.
- c. If the contractor or subcontractors, as appropriate, the laborers and mechanics (if known) to be employed in the additional classification or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the DOL, Administrator of the Wage and Hour Division, Employment Standards Administration, Washington, D.C. 20210. The Wage and Hour Administrator, or an authorized

representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

- d. In the event the contractor or subcontractors, as appropriate, the laborers or mechanics to be employed in the additional classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. Said Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary
- e. The wage rate (including fringe benefits where appropriate) determined pursuant to paragraph 2c or 2d of this Section IV shall be paid to all workers performing work in the additional classification from the first day on which work is performed in the classification.

3. Payment of Fringe Benefits:

- a. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor or subcontractors, as appropriate, shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly case equivalent thereof.
- b. If the contractor or subcontractor, as appropriate, does not make payments to a trustee or other third person, he/she may consider as a part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, provided, that the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

4. Apprentices and Trainees (Programs of the U.S. DOL) and Helpers:

- a. Apprentices:
 - (1) Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the DOL, Employment and Training Administration, Bureau of Apprenticeship and Training, or with a State apprenticeship agency recognized by the Bureau, or if a person is employed in his/her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship and Training or a State apprenticeship agency (where appropriate) to be eligible for probationary employment as an apprentice.
 - (2) The allowable ratio of apprentices to journeyman-level employees on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any employee listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate listed in the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor or subcontractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman-level hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.
 - (3) Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeyman-level hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator for the Wage and Hour Division determines that a different

practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

- (4) In the event the Bureau of Apprenticeship and Training, or a State apprenticeship agency recognized by the Bureau, withdraws approval of an apprenticeship program, the contractor or subcontractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the comparable work performed by regular employees until an acceptable program is approved.

b. Trainees:

- (1) Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the DOL, Employment and Training Administration.
- (2) The ratio of trainees to journeyman-level employees on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.
- (3) Every trainee must be paid at not less than the rate specified in the approved program for his/her level of progress, expressed as a percentage of the journeyman-level hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman-level wage rate on the wage determination which provides for less than full fringe benefits for apprentices, in which case such trainees shall receive the same fringe benefits as apprentices.
- (4) In the event the Employment and Training Administration withdraws approval of a training program, the contractor or subcontractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. Helpers:

Helpers will be permitted to work on a project if the helper classification is specified and defined on the applicable wage determination or is approved pursuant to the conformance procedure set forth in Section IV.2. Any worker listed on a payroll at a helper wage rate, who is not a helper under an approved definition, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed.

5. Apprentices and Trainees (Programs of the U.S. DOT):

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

6. Withholding:

The SHA shall upon its own action or upon written request of an authorized representative of the DOL withhold, or cause to be withheld, from the contractor or subcontractor under this contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements which is held by the same prime contractor, as much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or

part of the wages required by the contract, the SHA contracting officer may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

7. Overtime Requirements:

No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers, mechanics, watchmen, or guards (including apprentices, trainees, and helpers described in paragraphs 4 and 5 above) shall require or permit any laborer, mechanic, watchman, or guard in any workweek in which he/she is employed on such work, to work in excess of 40 hours in such workweek unless such laborer, mechanic, watchman, or guard receives compensation at a rate not less than one-and-one-half times his/her basic rate of pay for all hours worked in excess of 40 hours in such workweek.

8. Violation:

Liability for Unpaid Wages; Liquidated Damages: In the event of any violation of the clause set forth in paragraph 7 above, the contractor and any subcontractor responsible thereof shall be liable to the affected employee for his/her unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory) for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer, mechanic, watchman, or guard employed in violation of the clause set forth in paragraph 7, in the sum of \$10 for each calendar day on which such employee was required or permitted to work in excess of the standard work week of 40 hours without payment of the overtime wages required by the clause set forth in paragraph 7.

9. Withholding for Unpaid Wages and Liquidated Damages:

The SHA shall upon its own action or upon written request of any authorized representative of the DOL withhold, or cause to be withheld, from any monies payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph 8 above.

V. STATEMENTS AND PAYROLLS

(Applicable to all Federal-aid construction contracts exceeding \$2,000 and to all related subcontracts, except for projects located on roadways classified as local roads or rural collectors, which are exempt.)

1. Compliance with Copeland Regulations (29 CFR 3):

The contractor shall comply with the Copeland Regulations of the Secretary of Labor which are herein incorporated by reference.

2. Payrolls and Payroll Records:

- a. Payrolls and basic records relating thereto shall be maintained by the contractor and each subcontractor during the course of the work and preserved for a period of 3 years from the date of completion of the contract for all laborers, mechanics, apprentices, trainees, watchmen, helpers, and guards working at the site of the work.
- b. The payroll records shall contain the name, social security number, and address of each such employee; his or her correct classification; hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalent thereof of the types described in Section 1(b)(2)(B) of the Davis Bacon Act); daily and weekly number of hours worked; deductions made; and actual wages paid. In addition, for Appalachian contracts, the payroll records shall contain a notation indicating whether the employee does, or does not, normally reside in the labor area as defined in Attachment A, paragraph 1. Whenever the Secretary of Labor, pursuant to Section IV, paragraph 3b, has found that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in Section 1(b)(2)(B) of the Davis Bacon Act, the contractor and each subcontractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, that the plan or program has been communicated in writing to the laborers or mechanics affected, and show the cost anticipated or the actual cost incurred in providing benefits. Contractors or subcontractors employing

apprentices or trainees under approved programs shall maintain written evidence of the registration of apprentices and trainees, and ratios and wage rates prescribed in the applicable programs.

- c. Each contractor and subcontractor shall furnish, each week in which any contract work is performed, to the SHA resident engineer a payroll of wages paid each of its employees (including apprentices, trainees, and helpers, described in Section IV, paragraphs 4 and 5, and watchmen and guards engaged on work during the preceding weekly payroll period). The payroll submitted shall set out accurately and completely all of the information required to be maintained under paragraph 2b of this Section V. This information may be submitted in any form desired. Optional Form WH-347 is available for this purpose and may be purchased from the Superintendent of Documents (Federal stock number 029-005-0014-1), U.S. Government Printing Office, Washington, D.C. 20402. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors.
- d. Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his/her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:
 - (1) that the payroll for the payroll period contains the information required to be maintained under paragraph 2b of this Section V and that such information is correct and complete;
 - (2) that such laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in the Regulations, 29 CFR 3;
 - (3) that each laborer or mechanic has been paid not less than the applicable wage rate and fringe benefits or cash equivalent for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.
- e. The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 2d of this Section V.
- f. The falsification of any of the above certifications may subject the contractor to civil or criminal prosecution under 18 U.S.C. 1001 and 31 U.S.C. 231.
- g. The contractor or subcontractor shall make the records required under paragraph 2b of this Section V available for inspection, copying, or transcription by authorized representatives of the SHA, the FHWA, or the DOL, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the SHA, the FHWA, the DOL, or all may, after written notice to the contractor, sponsor, applicant, or owner, take such actions as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

VI. RECORD OF MATERIALS, SUPPLIES, AND LABOR

1. On all Federal-aid contracts on the National Highway System, except those which provide solely for the installation of protective devices at railroad grade crossings, those which are constructed on a force account or direct labor basis, highway beautification contracts, and contracts for which the total final construction cost for roadway and bridge is less than \$1,000,000 (23 CFR 635) the contractor shall:
 - a. Become familiar with the list of specific materials and supplies contained in Form FHWA-47, "Statement of Materials and Labor Used by Contractor of Highway Construction Involving Federal Funds," prior to the commencement of work under this contract.
 - b. Maintain a record of the total cost of all materials and supplies purchased for and incorporated in the work, and also of the quantities of those specific materials and supplies listed on Form FHWA-47, and in the units shown on Form FHWA-47.

- c. Furnish, upon the completion of the contract, to the SHA resident engineer on Form FHWA-47 together with the data required in paragraph 1b relative to materials and supplies, a final labor summary of all contract work indicating the total hours worked and the total amount earned.
2. At the prime contractor's option, either a single report covering all contract work or separate reports for the contractor and for each subcontract shall be submitted.

VII. SUBLETTING OR ASSIGNING THE CONTRACT

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the State. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635).
 - a. "Its own organization" shall be construed to include only workers employed and paid directly by the prime contractor and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor, assignee, or agent of the prime contractor.
 - b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid on the contract as a whole and in general are to be limited to minor components of the overall contract.
2. The contract amount upon which the requirements set forth in paragraph 1 of Section VII is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.
3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the SHA contracting officer determines is necessary to assure the performance of the contract.
4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the SHA contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the SHA has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

VIII. SAFETY: ACCIDENT PREVENTION

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the SHA contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.
2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 333).
3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 333).

IX. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, the following notice shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project:

Notice To All Personnel Engaged On Federal-Aid Highway Projects

18 U.S.C. 1020 READS AS FOLLOWS:

"Whoever being an officer, agent, or employee of the United States, or any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined not more than \$10,000 or imprisoned not more than 5 years or both."

X. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT

(Applicable to all Federal-aid construction contracts and to all related subcontracts of \$100,000 or more.)

By submission of this bid or the execution of this contract, or subcontract, as appropriate, the bidder, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any facility that is or will be utilized in the performance of this contract, unless such contract is exempt under the Clean Air Act, as amended (42 U.S.C. 1857 et seq., as amended by Pub.L. 91-604), and under the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et seq., as amended by Pub.L. 92-500), Executive Order 11738, and regulations in implementation thereof (40 CFR 15) is not listed, on the date of contract award, on the U.S. Environmental Protection Agency (EPA) List of Violating Facilities pursuant to 40 CFR 15.20.
2. That the firm agrees to comply and remain in compliance with all the requirements of Section 114 of the Clean Air Act and Section 308 of the Federal Water Pollution Control Act and all regulations and guidelines listed thereunder.
3. That the firm shall promptly notify the SHA of the receipt of any communication from the Director, Office of Federal Activities, EPA, indicating that a facility that is or will be utilized for the contract is under consideration to be listed on the EPA List of Violating Facilities.
4. That the firm agrees to include or cause to be included the requirements of paragraph 1 through 4 of this Section X in every nonexempt subcontract, and further agrees to take such action as the government may direct as a means of enforcing such requirements.

XI. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

1. Instructions for Certification - Primary Covered Transactions:

(Applicable to all Federal-aid contracts - 49 CFR 29)

- a. By signing and submitting this proposal, the prospective primary participant is providing the certification set out below.
- b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective primary participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.
- c. The certification in this clause is a material representation of fact upon which reliance was placed when the department or agency determined to enter into this transaction. If it is later determined that the prospective primary participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause of default.
- d. The prospective primary participant shall provide immediate written notice to the department or agency to whom this proposal is submitted if any time the prospective primary participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.
- e. The terms "covered transaction," "debarred," "suspended," "ineligible," "lower tier covered transaction," "participant," "person," "primary covered transaction," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the department or agency to which this proposal is submitted for assistance in obtaining a copy of those regulations.
- f. The prospective primary participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.
- g. The prospective primary participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," provided by the department or agency entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.
- h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the nonprocurement portion of the "Lists of Parties Excluded From Federal Procurement or Nonprocurement Programs" (Nonprocurement List) which is compiled by the General Services Administration.
- i. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.
- j. Except for transactions authorized under paragraph f of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion — Primary Covered Transactions

1. The prospective primary participant certifies to the best of its knowledge and belief, that it and its principals:

- a. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
 - b. Have not within a 3-year period preceding this proposal been convicted of or had a civil judgement rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
 - c. Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph 1b of this certification; and
 - d. Have not within a 3-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.
2. Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

2. Instructions for Certification - Lower Tier Covered Transactions:

(Applicable to all subcontracts, purchase orders and other lower tier transactions of \$25,000 or more - 49 CFR 29)

- a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.
- b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.
- c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.
- d. The terms "covered transaction," "debarred," "suspended," "ineligible," "primary covered transaction," "participant," "person," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations.
- e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.
- f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.
- g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the Nonprocurement List.
- h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is

not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

- i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion — Lower Tier Covered Transactions

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.
2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

XII. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

(Applicable to all Federal-aid construction contracts and to all related subcontracts which exceed \$100,000 - 49 CFR 20)

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:
 - a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
 - b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.
3. The prospective participant also agrees by submitting his or her bid or proposal that he or she shall require that the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such recipients shall certify and disclose accordingly.

FEDERAL-AID FEMALE AND MINORITY GOALS

In accordance with Section II, "Nondiscrimination," of "Required Contract Provisions Federal-aid Construction Contracts" the following are the goals for female utilization:

Goal for Women (applies nationwide).....(percent)	6.9
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The following are goals for minority utilization:

CALIFORNIA ECONOMIC AREA

		Goal (Percent)
174	Redding, CA:	
	Non-SMSA Counties	6.8
	CA Lassen; CA Modoc; CA Plumas; CA Shasta; CA Siskiyou; CA Tehama.	
175	Eureka, CA	
	Non-SMSA Counties	6.6
	CA Del Norte; CA Humboldt; CA Trinity.	
176	San Francisco-Oakland-San Jose, CA:	
	SMSA Counties:	
	7120 Salinas-Seaside-Monterey, CA	28.9
	CA Monterey.	
	7360 San Francisco-Oakland	25.6
	CA Alameda; CA Contra Costa; CA Marin; CA San Francisco; CA San Mateo.	
	7400 San Jose, CA	19.6
	CA Santa Clara.	
	7485 Santa Cruz, CA.	14.9
	CA Santa Cruz.	
	7500 Santa Rosa, CA	9.1
	CA Sonoma.	
	8720 Vallejo-Fairfield- Napa, CA	17.1
	CA Napa; CA Solano	
	Non-SMSA Counties	23.2
	CA Lake; CA Mendocino; CA San Benito	
177	Sacramento, CA:	
	SMSA Counties:	
	6920 Sacramento, CA	16.1
	CA Placer; CA Sacramento; CA Yolo.	
	Non-SMSA Counties	14.3
	CA Butte; CA Colusa; CA El Dorado; CA Glenn; CA Nevada; CA Sierra; CA Sutter; CA Yuba.	
178	Stockton-Modesto, CA:	
	SMSA Counties:	
	5170 Modesto, CA	12.3
	CA Stanislaus.	
	8120 Stockton, CA	24.3
	CA San Joaquin.	
	Non-SMSA Counties	19.8
	CA Alpine; CA Amador; CA Calaveras; CA Mariposa; CA Merced; CA Tuolumne.	

		Goal (Percent)
179	Fresno-Bakersfield, CA	
	SMSA Counties:	
	0680 Bakersfield, CA	19.1
	CA Kern.	
	2840 Fresno, CA	26.1
	CA Fresno.	
	Non-SMSA Counties	23.6
	CA Kings; CA Madera; CA Tulare.	
180	Los Angeles, CA:	
	SMSA Counties:	
	0360 Anaheim-Santa Ana-Garden Grove, CA	11.9
	CA Orange.	
	4480 Los Angeles-Long Beach, CA	28.3
	CA Los Angeles.	
	6000 Oxnard-Simi Valley-Ventura, CA	21.5
	CA Ventura.	
	6780 Riverside-San Bernardino-Ontario, CA.	19.0
	CA Riverside; CA San Bernardino.	
	7480 Santa Barbara-Santa Maria-Lompoc, CA	19.7
	CA Santa Barbara.	
	Non-SMSA Counties	24.6
	CA Inyo; CA Mono; CA San Luis Obispo.	
181	San Diego, CA:	
	SMSA Counties	
	7320 San Diego, CA.	16.9
	CA San Diego.	
	Non-SMSA Counties	18.2
	CA Imperial.	

In addition to the reporting requirements set forth elsewhere in this contract the Contractor and subcontractors holding subcontracts, not including material suppliers, of \$10,000 or more, shall submit for every month of July during which work is performed, employment data as contained under Form FHWA PR-1391 (Appendix C to 23 CFR, Part 230), and in accordance with the instructions included thereon.

FEDERAL REQUIREMENT TRAINING SPECIAL PROVISIONS

As part of the Contractor's equal employment opportunity affirmative action program, training shall be provided as follows:

The Contractor shall provide on-the-job training to develop full journeymen in the types of trades or job classification involved.

The goal for the number of trainees or apprentices to be trained under the requirements of this special provision will be 8.

In the event the Contractor subcontracts a portion of the contract work, he shall determine how many, if any, of the trainees or apprentices are to be trained by the subcontractor, provided however, that the Contractor shall retain the primary responsibility for meeting the training requirements imposed by this special provision. The Contractor shall also insure that this Training Special Provision is made applicable to such subcontract. Where feasible, 25 percent of trainees or apprentices in each occupation shall be in their first year of apprenticeship or training.

The number of trainees or apprentices shall be distributed among the work classifications on the basis of the Contractor's needs and the availability of journeymen in the various classifications within a reasonable area of recruitment. Prior to commencing work, the Contractor shall submit to the Department for approval the number of trainees or apprentices to be trained in each selected classification and training program to be used. Furthermore, the Contractor shall specify the starting time for training in each of the classifications. The Contractor will be credited for each trainee or apprentice employed by him on the contract work who is currently enrolled or becomes enrolled in an approved program and will be reimbursed for such trainees or apprentices as provided hereinafter.

Training and upgrading of minorities and women toward journeymen status is a primary objective of this Training Special Provision. Accordingly, the Contractor shall make every effort to enroll minority and women trainees or apprentices (e.g., by conducting systematic and direct recruitment through public and private sources likely to yield minority and women trainees or apprentices) to the extent such persons are available within a reasonable area of recruitment. The Contractor will be responsible for demonstrating the steps that he has taken in pursuance thereof, prior to a determination as to whether the Contractor is in compliance with this Training Special Provision. This training commitment is not intended, and shall not be used, to discriminate against any applicant for training, whether a member of a minority group or not.

No employee shall be employed as a trainee or apprentice in any classification in which he has successfully completed a training course leading to journeyman status or in which he has been employed as a journeyman. The Contractor should satisfy this requirement by including appropriate questions in the employee application or by other suitable means. Regardless of the method used the Contractor's records should document the findings in each case.

The minimum length and type of training for each classification will be as established in the training program selected by the Contractor and approved by both the Department and the Federal Highway Administration. The Department and the Federal Highway Administration will approve a program if it is reasonably calculated to meet the equal employment opportunity obligations of the Contractor and to qualify the average trainee or apprentice for journeyman status in the classification concerned by the end of the training period. Furthermore, apprenticeship programs registered with the U.S. Department of Labor, Bureau of Apprenticeship and Training, or with the State of California, Department of Industrial Relations, Division of Apprenticeship Standards recognized by the Bureau and training programs approved but not necessarily sponsored by the U.S. Department of Labor, Manpower Administration, Bureau of Apprenticeship and Training shall also be considered acceptable provided it is being administered in a manner consistent with the equal employment obligations of Federal-aid highway construction contracts. Approval or acceptance of a training program shall be obtained from the State prior to commencing work on the classification covered by the program. It is the intention of these provisions that training is to be provided in the construction crafts rather than clerk-typists or secretarial-type positions. Training is permissible in lower level management positions such as office engineers, estimators, timekeepers, etc., where the training is oriented toward construction applications. Training in the laborer classification may be permitted provided that significant and meaningful training is provided and approved by the division office. Some offsite training is permissible as long as the training is an integral part of an approved training program and does not comprise a significant part of the overall training.

Except as otherwise noted below, the Contractor will be reimbursed 80 cents per hour of training given an employee on this contract in accordance with an approved training program. As approved by the Engineer, reimbursement will be made for training of persons in excess of the number specified herein. This reimbursement will be made even though the Contractor receives additional training program funds from other sources, provided such other source does not specifically prohibit the Contractor from receiving other reimbursement. Reimbursement for offsite training indicated above may only be made to the Contractor where he does one or more of the following and the trainees or apprentices are concurrently employed on a Federal-aid project; contributes to the cost of the training, provides the instruction to the trainee or apprentice or pays the trainee's or apprentice's wages during the offsite training period.

No payment shall be made to the Contractor if either the failure to provide the required training, or the failure to hire the trainee or apprentice as a journeyman, is caused by the Contractor and evidences a lack of good faith on the part of the Contractor in meeting the requirements of this Training Special Provision. It is normally expected that a trainee or apprentice will begin his training on the project as soon as feasible after start of work utilizing the skill involved and remain on the project as long as training opportunities exist in his work classification or until he has completed his training program. It is not required that all trainees or apprentices be on board for the entire length of the contract. A Contractor will have fulfilled his responsibilities under this Training Special Provision if he has provided acceptable training to the number of trainees or apprentices specified. The number trained shall be determined on the basis of the total number enrolled on the contract for a significant period.

Only trainees or apprentices registered in a program approved by the State of California's State Administrator of Apprenticeship may be employed on the project and said trainees or apprentices shall be paid the standard wage specified under the regulations of the craft or trade at which they are employed.

The Contractor shall furnish the trainee or apprentice a copy of the program he will follow in providing the training. The Contractor shall provide each trainee or apprentice with a certification showing the type and length of training satisfactorily completed.

The Contractor will provide for the maintenance of records and furnish periodic reports documenting his performance under this Training Special Provision.